PATENT APPLICATION

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Hiroshi IIDA

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For: SERVICE PROCESSING SYSTEM, PROCESSING RESULT MANAGEMENT DEVICE AND PROCESSING RESULT CHECKING METHOD OF SERVICE PROCESSING SYSTEM

SUBMISSION OF ACCURATE TRANSLATION OF PRIORITY DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with 37 CFR 1.78 (a)(5), and further to the Request for Reconsideration filed October 19, 2006, attached is a translation of Japanese Patent Application No. 2003-081200 filed on March 24, 2003. Based upon our information and belief, the attached English language translation of the priority document is an accurate translation.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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Attached:
Accurate Translation of Japanese Application No. 2003-081200

Date: November 15, 2006

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[COMPREHENSIVE POWER OF ATTORNEY] 9503322

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[NECESSARY OF PROOF?] Yes

[Document] Specification

[Title of the Invention] SERVICE PROCESSING SYSTEM, PROCESSING RESULT CHECKING METHOD OF SERVICE PROCESSING SYSTEM, AND SERVICE PROCESSING PROGRAM

[Scope of the Claims]

1. A service processing system processing a service for performing predetermined linkage processing on document data over a network, comprising:

a plurality of service processors including:

processing means that performs individual processing that constitutes the service;

memory means that stores processing result logs of the processing means;

a processing result management device including:

receiving means that receives the processing result logs stored in the memory means; and

generating means that generates service result information indicating whether linkage processing of the service has been completed in a normal manner, on the basis of the processing result logs of the plurality of service processors received by the receiving means.

2. The service processing system according to claim 1, wherein the processing result management device further includes an output means that outputs the service result information.

3. The service processing system according to claim 1 or 2, wherein the processing result management device is included in at least one of the plurality of service processors.

4. The service processing system according to claim 3, wherein the receiving means receives the processing result logs through the service processors.

5. A processing result checking method of a service processing system that processes a service for performing predetermined linkage processing on document data among a plurality of service processors connected to a network, comprising:

receiving processing result logs in the service processors performing individual processing of the service from the plurality of service processors; and

generating service result information indicating whether the service has been completed in a normal manner, on the basis of the received processing result logs.

6. The processing result checking method of a service processing system according to claim 5, further outputting the service result information.

7. The processing result checking method of a service processing system according to claim 5 or 6, wherein the service result information is generated by at least one of the plurality of service processors performing the individual processing.

8. The processing result checking method of a service processing system according to claim 7, wherein the processing result logs are received from the plurality of service processors performing the individual processing.

9. A service processing program processing a service for performing predetermined linkage processing on document data among a plurality of service processors connected to a network, wherein

processing is performed, which includes a generating step that receives processing result logs of service processors, which performs individual processing that constitutes the service, from the plurality of service processors and generates service result information indicating whether the service has been completed in a normal manner, on the basis of the received processing result logs.

10. The service processing program according to claim 9, wherein processing is performed, in which an output step is further included which outputs the service result information.

11. The service processing program according to claim 9 or 10, wherein the generating step uses at least one of the plurality of service processors in order to perform individual processing that constitutes the service.

12. The service processing program according to any of claims 9-11, wherein the generating step receives the processing result logs through the plurality of service processors performing individual processing.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to a service processing system, a processing result checking method of the service processing system, and to a service processing program, and particularly a service program system that generates a work flow for paper documents converted into electronic documents, a processing result checking method of the service processing system, and a service processing program.

[0002]

[Prior Art]

There is a proposed work flow system in which a scanner, a facsimile device, a copying device, or a multi-function device combining them, a personal computer, a mail server, and the like are connected with each other over a network to share paper documents and electronic information among them.

[0003]

Furthermore, with the advance of Internet technologies, Web services are proposed which easily perform more advanced task processing by linking applications developed independently of each other. The Web services make it possible to easily create more advanced task systems by use of applications on a network as service components. By linking and combining these services, new services are created.

[0004]

For example, according to technology described in Patent Reference 1, a work flow management system is proposed which defines a work flow representative of a task processing configuration in which information processors such as workstations (WS) and personal computers (PC) connected to networks such as LAN and WAN are used to execute tasks having a continuous flow with involvement of plural operators through mutual exchange of electronic mail, electronic documents, and task related data among the information processors. The work flow management system also includes a work flow server device that issues individual task commands on the basis of the definition, and grasps and monitors the progress of the individual tasks, and a work flow client device that receives task commands issued from the work flow server device and executes the tasks, wherein the client device is provided with a batch processing type task execution means that automatically activates task application programs and means that reports the execution results to the work flow server device, and wherein the work flow server device includes work flow execution control means that determines the execution results of the batch processing type tasks, reported from the client device, on the basis of predefined determination conditions, and controls the work flow according to the determination result. By the work flow management system thus configured, a batch processing type work flow

activity to let the information processors automatically execute the task application programs can be efficiently included in the work flow tasks.

[0005]

[Patent Reference 1]

Japanese Published Patent Application 2001-282970

[0006]

[Problem to be Resolved by the Invention]

However, when a system, such as a facsimile device without using paper, using a device is included in processing included in a work flow, when a facsimile document received by the device is to be processed by service on a computer and distributed (print, mail, folder storage, etc.), sometimes, due to a communication problem or the like, only communication history exists on the device and the received document does not exist. In such cases, there is a problem that job is not activated by the service on the computer and the user cannot immediately recognize the occurrence of the problem.

[0007]

Also, if a data input error occurs during image reading or mail receiving, job is not activated.

[0008]

Thus, to avoid such a situation, arrangements and settings are required to report problems in input sources.

[0009]

However, this would require problem monitoring and notification by service on individual computers for problems after job activation, making setting operations complicated.

Since various input errors are reported, it is difficult to selectively report only specific input errors.

[0010]

The present invention has been made to address the above problem and provides a service processing system that can reliably show problem occurrence in each service device when processing a service for performing predetermined processing on document data through the linkage among plural devices connected to a network according to predetermined processing contents, a processing result checking method of the service processing system, and a service processing program.

[0011]

[Means of Solving the Problem]

In order to accomplish the above-mentioned object, the invention as described in claim 1 is a service processing system processing a service for performing predetermined linkage processing on document data over a network and is provided with a plurality of service processors including: processing means that performs individual processing that constitutes the service; and memory means that stores processing result logs of the processing means; a processing result management device including: receiving means that receives the processing result logs stored in the memory means; and generating means that generates service result information indicating whether linkage processing of the service has been completed in a normal manner, on the basis of the processing result logs of the plurality of service processors received by the receiving means.

[0012]

According to the invention as described in claim 1, in the processing means, individual processing is performed, which constitutes a service performing a predetermined processing with respect to document data. That is, one service is performed by linking individual processing of the processing means of each service processor.

[0013]

Additionally, a processing result log as to whether the individual processing by the processing means has been completed in a normal manner is stored in the memory means.

[0014]

Meanwhile, in the processing result management device, the processing result logs stored in the memory means of each service processor is obtained by receiving means, and service result information showing whether the processing of service linkage has been completed in a normal manner based on the processing result logs is generated by generating means. Therefore, service result information generated from the processing result logs that are the results of individual processing of each service processing device can be obtained, so problem occurrence in each service device can be reliably discovered.

[0015]

Additionally, just like the invention as described in claim 2, the processing result abnormal determination device may be further provided with outputting means that outputs service result information generated by the generating means. For example, the service result information may be electronically transmitted, printed, and transmitted by a facsimile device.

[0016]

Furthermore, just like the invention described in claim 3, the processing result management device may be constituted so as to be included in at least one service processor

among a plurality of service processors. In this case, just like the invention of claim 4, the receiving means of the processing result management device may obtain the processing result logs via each service processor. For example, when the processing result management device is included in the service processor that performs the beginning of the individual processing that constitutes a service, a service processor that performs the proceeding of the individual processing sequentially obtains processing result logs and obtains the processing result logs via each service processor, and the processing result management device can obtain the processing result logs of each service processor by the receiving means.

[0017]

The invention described in claim 5 is a processing result checking method of a service processing system that processes a service for performing predetermined linkage processing on document data among a plurality of service processors connected to a network, comprising: receiving processing result logs in the service processors performing individual processing of the service from the plurality of service processors; and generating service result information indicating whether the service has been completed in a normal manner, on the basis of the received processing result logs.

[0018]

According to the invention described in claim 5, processing result logs of individual processing of the service are received from the plurality of service processors, and service result information is generated, which indicates whether the service has been completed in a normal manner, on the basis of the received processing result logs. That is, according to the generated service result information, it can be determined whether the service has been completed in a normal manner. Therefore, according to the generated service result information, problem

occurrence in each service processor that performs individual processing constituting a service can be reliably discovered.

[0019]

Furthermore, just like the invention described in claim 6, service result information showing whether the service has been completed in a normal manner can be further output. For example, the service result information can be electronically transmitted, printed, and transmitted by a facsimile device.

[0020]

Furthermore, according to the invention described in claim 7, generation of the service result information showing whether the service has been completed in a normal manner can be performed by at least one of service processors among a plurality of service processors performing individual processing that constitutes a service. In this case, according to the invention described in claim 8, the processing result log can be received via a plurality of service processors that performs individual processing that constitutes a service. For example, when a service processor that performs the beginning of individual processing that constitutes a service generates service result information showing whether the service has been completed in a normal manner, each service processor sequentially receives processing result logs from a service processor that performs the following stage of individual processing and receives processing result logs via each service processor, so the service processor that generates service result information showing whether the service has been completed in a normal manner can receive processing result logs of each service processor.

[0021]

The invention as described in claim 9 is a service processing program processing a service for performing predetermined linkage processing on document data among a plurality of service processors connected to a network, wherein processing is performed, which includes a generating step that receives processing result logs of service processors, which performs individual processing that constitutes the service, from the plurality of service processors and generates service result information indicating whether the service has been completed in a normal manner, on the basis of the received processing result logs.

[0022]

According to the invention described in claim 9, in the generating step, processing is performed, in which processing result logs of individual processing that constitutes the service is received from the plurality of service processors, and service result information is generated, which indicates whether the service has been completed in a normal manner, on the basis of the received processing result logs. That is, it can be determined whether the service has been completed in a normal manner from the generated service result information. Thus, problem occurrence in each service processor that performs individual processing constituting a service can be reliably discovered.

[0023]

Furthermore, in the invention described in claim 9, processing can be performed, which further includes the outputting step that outputs the generated service result information. For example, the service result information can be electronically transmitted, printed, and transmitted by a facsimile device.

[0024]

Furthermore, just like the invention described in claim 11, the generating step can be performed by at least one of the plurality of service processors that performs individual processing that constitutes the service. In this case, just like the invention described in claim 12, the generating step can receive the processing result logs through the plurality of service processors performing individual processing that constitutes a service. For example, when a service processor that performs the beginning of the individual processing that constitutes a service generates service result information showing whether the service has been completed in a normal manner, each service processor sequentially receives processing result logs from the service processor that performs the following stage of individual processing and receives processing result logs via each service processor, so the service processor that generates the service result information showing whether the service has been completed in a normal manner can receive processing result logs of each service processor.

[0025]

[Embodiments]

Hereinafter, embodiments of the present invention will be described with reference to the drawings.

[First Embodiment]

A description is made of a basic configuration of a document processing system according to a first embodiment of the present invention.

(System Basic Structure)

Fig. 1 is a block diagram showing a configuration of a document processing system 10 according to an embodiment of the present invention.

[0026]

The document processing system 10 has various services and applications connected over a network 12. The term "services" refers to functions available on documents, provided in response to a request from the outside. The services include, e.g., copying, printing, scanning, facsimile transmission and reception, mail distribution, storing to a repository, reading from a repository, OCR (Optical Character Recognition) processing, noise elimination processing, and the like. The present invention places no special limitations on the services.

[0027]

Specifically, the document processing system 10 is provided with a client terminal 14 having a user interface in which a user's desired processing is instructed by linking plural services; a service search server 16 searching user's desired services; an instruction form generating server 18 generating an instruction form from information about service linkage specified in the client terminal 14; an instruction form management server 20 managing instruction forms; and a linkage processing server 22 linking services according to an instruction form.

[0028]

Furthermore, the document processing system 10 is provided with service processors 24 performing specific processing for executing various services, such as an image processor 24A that performs image processing such as a noise elimination processing of image documents, image rotation processing, OCR processing, and image binding; a document management server 24B managing documents; a document distribution server 24C distributing documents; a multi-function device 24D having plural functions of a facsimile device, a printer, a scanner, and the like; and a first service processor 24E performing first service processing.

[0029]

The service processors 24, as shown in Fig. 2, have a microcomputer including a CPU 24a, a ROM 24b, a RAM 24c, and a user interface (UI) 24d that are connected to a bus 24e.

[0030]

The ROM 24b stores applications and programs for executing various services, programs for executing service linkage, and the like.

[0031]

Additionally, in this embodiment, each service processor 24 has a function for storing as logs the results of specific processing performed in each service processor 24, and a log generating unit 24f generating logs of processing results is connected to the bus 24e. That is, logs generated by the log generating unit 24f are stored in the RAM 24c. Additionally, logs generated by the log generating unit 24f may also be stored in a memory specifically provided.

[0032]

Furthermore, in this embodiment, the document processing system 10 is configured so that plural servers performing predetermined service processing are connected via the network 12. However, there are no special limitations on the configuration of the document processing system 10 as long as plural services are connected via the network 12.

[0033]

The term "instruction form" refers to, when a series of processing is broken down into plural functional processes, data including information representing relationships among the functions, interface (I/F) information for calling each function, and information for forming a graphical user interface (GUI) on a series of processes.

[0034]

Fig. 3 is a block diagram for explaining the interrelationship among the service processors 24 of the document processing system 10. The service processors 24 store I/F information representing the contents of services provided by themselves.

[0035]

Fig. 4 is a conceptual diagram showing the configuration of I/F information. The I/F information includes <service class>, <service name>, <service icon>, <service location information>, <input>, <output>, <parameter restriction rules>, <service location>, <method name>, <invocation scheme>, and <implicit elements>.

[0036]

<service class> indicates the class of service provided by the service processors 24. As <service class>, a class defined in advance such as scan, print, repository, and a flow is used. <service name> is the name of service provided by the service processors 24. <service icon> indicates position information of an icon displayed in GUI of the client terminal 10.

[0037]

<service location information> indicates URL used to receive I/F information by the instruction form generating server 30 [sic. 18]. <input> indicates input to service. <output> indicates output from service. <parameter restriction rules> indicate restriction rules applied to <input> and <output>. <service location> indicates position information when service is actually used. <method name> specifies a method of providing service processing and a name indicating the service.

[0038]

<invocation scheme> indicates a method of invocating service processing. As <invocation scheme>, message switching protocols SOAP (Simple Object Access Protocol),

SMTP (Simple Mail Transfer Protocol), and the like can be used. <implicit elements> is not data explicitly passed to processing of a following stage as output, but data that can be referred to in processing of the following stage.

[0039]

The client terminal 14 has the function of a graphical user interface (GUI) through which the user directs the generating of an instruction form, and displays an image on a screen and performs required operations to select the instruction form to be activated, and the function of a user interface (UI) through which the user analyzes a problem occurring in the middle of service.

[0040]

The service search server 16 searches services meeting search conditions from among plural services connected to the network 12. The service search server 16 stores in advance part of I/F information (hereinafter referred to as partial I/F information) of various service processors 24 such as the image processor 24A, the document management server 24B, the document distribution server 24C, the first service processor 24D, and the service processor 24E [In Figs. 1 and 3, 24D is described as a "multi-function device," and 24E is described as a "first service processor"]. The partial I/F information refers to <service information>, <service name>, <service location information>, <input>, and <output information> of the elements of I/F information.

[0041]

The service search server 16, when search conditions are transmitted from the instruction form generating server 18 and the linkage processing server 22, searches services using the partial I/F information of the service processors 24. For example, the service search server 16,

when searching the same service as a specified service, may search services matching in <service class>, services matching in <input> and <output>, and services matching in all of them.

[0042]

The instruction form generating server 18, when generating an instruction form, receives I/F information from the service processors 24 and generates an instruction form for linking services provided from the service processors 24. The instruction form generating server 18 performs the following processing to generate an instruction form.

[0043]

The instruction form generating server 18 makes a request to transmit I/F information on individual services from required service processors 24 distributed over the network 12 on the basis of <service location information>. If required service processors 24 do not exist, the instruction form generating server 18 may command the service search server 16 to search other service processors 24 providing the same services that the required service processors 24 provide. The instruction form generating server 18 may receive <service location information> of the other service processors 24 from the service search server 16.

[0044]

The instruction form generating server 18 manages search results from the service search server 16 and I/F information received from the service processors 24. The instruction form generating server 18 generates an HTML file for generating a GUI screen for defining a job flow on the basis of I/F information received from the service processors 24. Upon receipt of a service browsing request from the client terminal 14, the instruction form generating server 18 transmits the HTML file for generating the GUI screen to the client terminal 14.

[0045]

Fig. 5 is a diagram showing an instruction form generating screen 26, which is a GUI screen for defining a job flow. The instruction form generating screen 26 is configured with a service window 26A, a flow window 26B, a logic window 26C, and a property window 26D.

[0046]

The service window 26A displays usable various service processors 24. The logic window 26C displays a job flow indicating patterns of linkage among services. The property window 26D displays a detailed setting pattern of icons displayed on the service window 26A and the logic window 26C.

[0047]

The user can define a job flow in the flow window 26B by dragging and dropping icons of the service window 26A and icons of the logic window 26C to the flow window 26B. The user can set services and a relationship among the services such as logics in detail by editing information displayed on the property window 26D.

[0048]

The client terminal 14 transmits job flow information defined by the user's operations to the instruction form generating server 18.

[0049]

The instruction form generating server 18 generates an instruction form defining the contents of processing desired for services, input parameters, a method of linkage among the services (job flow), and information for identifying a document to be processed, such as a document name and storage location information, on the basis of job flow information about service linkage commands from the user and I/F information of the services. In this embodiment, the instruction form is constituted by a file of an XML format.

[0050]

Fig. 6 is a conceptual diagram showing an instruction form formed in XML format. Since the linking of plural services is regarded as one service, the instruction form has <flow> added to the I/F information shown in Fig. 4.

[0051]

<flow>, which is an element describing the linkage among services, includes <invoke>, <if> and other elements for control structures, logical calculations, and condition determination, operation commands of XML structure for adjusting the linkage among services, information for identifying a document to be processed, and the like.

[0052]

<activation> indicates a specific method of the service processors 24, and executes calling of service. <activation> includes <map> element indicating position information of parameters and <method> element specifying a method name to be invoked. <if>, <and>, <eq>, and <gt> indicating logical structures, logical calculations, and the like make conditional branch during linkage processing and adjust parameters exchanged among services.

[0053]

An instruction form contains all information about control of service linkage processing in the <flow> element. Because of this, linkage processing itself represented by the instruction form is regarded as one service. Additionally, the instruction form is not limited to the structure shown in Fig. 6 as long as services can be linked.

[0054]

The instruction form generating server 18 transmits an instruction form of XML format as described above to the instruction form management server 20. The instruction form generating

server 18 may transmit the instruction form directly to the linkage processing server 22 when the execution of service linkage processing is specified by the user.

[0055]

The instruction form management server 20 holds an instruction form transmitted from the instruction form generating server 18, and transmits the instruction form to the linkage processing server 22 in response to a request from the client terminal 14.

[0056]

The linkage processing server 22 is a server that interprets and executes a specified instruction form and obtains logs of processing results stored in the service processors 24 to check processing results of service linkage when a problem occurs. When an instruction form is transmitted, the linkage processing server 22 interprets the instruction form, and according to an instruction form and usage specified in the instruction form, sequentially calls the service processors 24 such as the image processor 24A, the document management server 24B, and the document distribution server 24C to perform linkage processing. Additionally, the linkage processing server 22 stores information such as the status of linkage processing in execution and the result of the linkage processing completed, and reports the status and results of the linkage processing in response to a request from the outside.

[0057]

The linkage processing server 22, when interpreting an instruction form and making a request to the service processors 24, generates specific instruction information having processing request contents, input parameters, information for identifying a document to be processed, a service ID for identifying a job flow (service linkage) by the instruction form, and the like. Additionally, the linkage processing server 50 [sic. 22] may extract information related to service

processing before and after processing for linking processing performed in the service processors 24 and describe it in the instruction form, or may, without using the form of an instruction form, make a processing request in an information exchange format specific to each of the service processors 24.

[0058]

Additionally, the linkage processing server 22 obtains logs stored in the service processors 24 in association with service IDs and manages them.

[0059]

The image processor 24A is a computer in which a software program having image processing functions is installed. The image processor 24A processes a document on the basis of service processing request contents, input parameters, and information about a document to be processed included in a processing request from the linkage processing server 22. Furthermore, the image processor 24A, when activated, informs partial I/F information to the service search server 16. Additionally, the image processor 24A sends I/F information indicating a method of using image processing service in response to a request from the instruction form generating server 18. The I/F information is used when an instruction form is generated.

[0060]

The document management server 24B has a document storing function. The document management server 24B, on the basis of information contained in a request from the linkage processing server 22, stores, searches, and reads documents and performs attribute change and other processing on the documents. The document management server 24B, when activated, informs partial I/F information to the service search server 16. Furthermore, the document

management server 24B sends I/F information indicating a method of using document management service in response to a request from the instruction form generating server 18.

[0061]

The document distribution server 24C stores a received document in a specified document management server, transmits electronic mails and fax to a specified transmitting destination, and performs printout processing for a specified printer. The document distribution server 24C, in response to a request from the linkage processing server 22, performs document distribution processing on the basis of information of a document specified in the client terminal 14 and its distribution destination. The document distribution server 24C, when activated, informs partial I/F information to the service search server 16. The document distribution server 24C sends I/F information indicating a method of using distribution processing service in response to a request from the instruction form generating server 18.

[0062]

The multi-function device 24D transmits received documents with a facsimile device and prints them. The multi-function device 24D performs service processing such as facsimile transmission and printing to be performed in the device on the basis of processing request contents from the linkage processing server 22, input parameters, information for identifying a document to be processed, and other information. The multi-function device 24D, when activated, sends partial I/F information to the service search server 16. The multi-function device 24D sends I/F information indicating a method of using service processing in response to a request from the instruction form generating server 18. The multi-function device 24D may be a facsimile device connected via a public line.

[0063]

The first service processor 24E performs predetermined service processing on documents according to commands from the outside. The first service processor 24E performs service processing to be performed in the device on the basis of processing request contents from the linkage processing server 22, input parameters, information for identifying a document to be processed, and other information. The first service processor 24E, when activated, informs partial I/F information to the service search server 16. The first service processor 24E sends I/F information indicating a method of using service processing in response to a request from the instruction form generating server 18.

[0064]

The linkage processing server 22 of this embodiment has a processing result management function for checking whether the service processors 24 normally complete processing, when linking services using the service processors 24. As shown in Fig. 7, the linkage processing server 22 has a processing result management function 40 including: a user interface (UI) 42 that indicates to confirm whether individual processing of the service processors 24 is completed in a normal manner and display the confirmation result; a log receiving unit 44 that obtains logs stored in the service processors 24; a log comparison determination unit 46 that determines whether service linkage is completed in a normal manner, from logs obtained by the log receiving unit 44; a comparison determination result generating unit 48 that generates service linkage logs representing comparison determination results of a given format from comparison determination results of the log comparison determination unit 46; and a result distribution unit 50 that stores service linkage logs in a predetermined folder, transmits them by electronic mail, and performs other processing.

[0065]

That is, the linkage processing server 22 obtains logs of the service processors 24 stored in association with service ID, and can determine whether service linkage corresponding to a desired service ID is completed in a normal manner.

[0066]

Additionally, each means of the processing result confirmation function 40 [In section [0064], 40 was described as "processing result management function"] may be configured in hardware or with software programs.

[0067]

In the document processing system 10 thus constituted, the service processors 24 such as the image processor 24A, the document management server 24B, the document distribution server 24C operate as follows when application programs for executing their respective predetermined services are installed.

[0068]

The service processors 24 such as the image processor 24A, the document management server 24B, the document distribution server 24C, the first service processor 24D, and the second service processor 24E [In Figs. 1 and 3, 24D is described as a "multi-function device," and 24E is described as a "first service processor"], in activation processing, inform I/F information containing their respective service summary and address information to the service search server 16.

[0069]

The service search server 16 stores partial I/F information transmitted from the service processors 24 such as the image processor 24A, the document management server 24B, the document distribution server 24C, the first service processor 24D, and the second service

processor 24E. Because of this, the service search server 16 can perform search using partial I/F information, for example, when predetermined service search requests are issued from the instruction form generating server 18 and the linkage processing server 22.

[0070]

(Creation of Instruction Form)

Fig. 8 is a flowchart showing a processing procedure of the client terminal 14 and the instruction form generating server 18 when an instruction form is generated.

[0071]

The client terminal 14 accesses URL (Uniform Resource Locator) of HTML file generated for a user interface screen provided by the instruction form generating server 18 through an installed browser according to the user's operations (step S10).

[0072]

The instruction form generating server 18 transmits the HTML file of the user interface screen to the client terminal 14 in response to a browsing request from the client terminal 14 (step S12).

[0073]

The client terminal 14 displays a user interface screen on the basis of information constituting a screen included in, e.g., an HTML file, transmitted from the instruction form generating server 18 (step S14). At this time, the user can define a job flow of desired service linkage by using the user interface screen displayed in the client terminal 14.

[0074]

The client terminal 14 determines whether a job flow is defined, via the user interface screen, and awaits until a job flow is defined (step S16). When it is determined that a job flow

has been generated, the client terminal 14 transmits job flow information about service linkage defined by the user to the instruction form generating server 18.

[0075]

The instruction form generating server 18 generates an instruction form defining the contents of processing desired for services, input parameters, a method of linkage among the services, a document name, storage location information, information (service ID) for identifying a document to be processed, and other information, on the basis of job flow information of service linkage transmitted from the client terminal 14 and I/F information received from the service processors 24 (step S18). The instruction form generating server 18 transmits the instruction form of XML format to the instruction form management server 20.

[0076]

The instruction form management server 20 stores the instruction form generated in the instruction form generating server 18. The instruction form management server 20 stores plural instruction forms generated by the instruction form generating server 18 and reads an instruction form that is selected when selection of the instruction form is given from the client terminal 14.

[0077]

(Activation and Execution of Linkage Processing)

The user selects a desired instruction form from among plural instruction forms stored in the instruction form management server 20 to activate linkage processing. Details are given below.

[0078]

The client terminal 14 accesses the instruction form management server 20 to receive an instruction form list managed in the instruction form management server 20. For example, the

client terminal 14 receives a service linkage processing selection screen 28 displaying an instruction form list as shown in Fig. 9, and selects a desired instruction form. Additionally, an instruction form can be selected, for example, by the user selecting a button corresponding to a desired instruction form from buttons 28A to 28H for selecting instruction forms, which are respectively provided for the instruction forms of the service linkage processing selection screen 28.

[0079]

The client terminal 14 selects an instruction form indicating predetermined service linkage processing from the service linkage processing selection screen 28 according to the user's operation commands, and directs the activation of the instruction form. The client terminal 14 displays a parameter input screen to the user as needed and receives parameters required for job execution.

[0080]

The instruction form management server 20 sends the instruction form specified by the client terminal to the linkage processing server 22. As a result, the linkage processing server 22 starts execution of linkage processing.

[0081]

That is, the linkage processing server 22 interprets the instruction form sent from the instruction form management server 20 and requests a service processor 24 specified in the instruction form to perform specific processing. The linkage processing server 22, on the basis of information contained in the instruction form, extracts the location of a service processor 24 requested for processing, input and output parameters required for the processing request, a method name for the processing request, an activation method, and information for identifying a

document to be processed, and generates specific instruction information and a service ID. The linkage processing server 22 transmits the specific instruction information and the service ID to the service processors 24 described in the instruction form. Furthermore, the linkage processing server 22 requests the service processors 24 to execute service processing in the order according to the instruction form.

[0082]

A description is made of an example of processing performed in the service processor 24 with reference to a flowchart of Fig. 10.

[0083]

The service processor 24 first determines whether individual instruction information and service ID sent from the linkage processing server 22 are received, and awaits until receiving them (S30). The service processors 24 generates a duplication of a document to be processed, on the basis of the storage destination location information of the document to be processed, described in the individual instruction information, and receives the document (S32).

[0084]

The service processor 24 interprets the service processing request content described in the individual instruction information and performs service processing for the obtained document (S34), and again stores in the original storage destination the document for which the service processing has been performed (S36).

[0085]

Additionally, the service processor 24 determines whether individual processing based on the service processing request is completed in a normal manner (S38). If so, generates a log indicating normal completion in the log generating unit 24f (S40). If not, the service processor

24 generates a log indicating abnormal completion in the log generating unit 24f (S42). These logs are stored in the RAM 24c of the service processors 24.

[0086]

For example, the log generating unit 24f of the service processors 24, as shown in Fig. 11, generates, as a log, a job ID for identifying processing in the specified device, a service ID for identifying service linkage, a data input source (e.g., facsimile device, scanner, etc.), service linkage contents, processing contents (job contents) of the specified device, start time, required time, status (normal completion, abnormal completion, etc.), error contents (e.g., timeout, etc.) at abnormal completion, and the like.

[0087]

Furthermore, it is determined whether a request for obtaining a log generated from the linkage processing server 22 is made (S44). If the request is made, the generated log is transmitted to the linkage processing server 22 (S46).

[0088]

Thus, the service processors 24 store processing results of the specified device, and the processing results are transferred to the linkage processing server 22 as the user gives an instruction via the UI 42 of the linkage processing server 22. Accordingly, the linkage processing server 22 can confirm a processing state during service linkage from logs of the service processors 24.

[0089]

A description is made of the checking of processing results during service linkage in the linkage processing server 22, with reference to a flowchart of Fig. 12.

[0090]

The linkage processing server 22 determines whether an instruction of obtaining the processing results of service linkage is made and awaits until the instruction of obtaining the processing results of service linkage is made (S50). The instruction of obtaining the service linkage processing result can be made, for example, via the network 12 and the UI 42 of the linkage processing server 22 from the client terminal 14. The instruction of obtaining the service linkage processing result can also be made directly from the UI 42 of the linkage processing server 22.

[0091]

When obtaining the service linkage processing result is instructed, the linkage processing server 22 issues a request of obtaining the service linkage processing results to the service processors 24 connected to the network 12 (S52), determines whether the log receiving unit 44 has obtained service linkage processing results, and otherwise awaits until receiving service linkage processing results (S54).

[0092]

Upon receiving the service linkage processing results, the linkage processing server 22, in the log comparison determination unit 46, performs log comparison determination processing to determine whether processing of each service linkage is completed in a normal manner, on the basis of the received logs of the service processors 24 (S56). That is, it can be determined whether all service linkages have been completed in a normal manner by referring to and comparing results of individual processing of each service processor 24 for each service ID.

[0093]

Furthermore, the linkage processing server 22 generates a service linkage log of each service linkage from the received results of specific processing of each service processor 24

(S58). For example, as shown in Fig. 13, logs of the service processors and service linkage logs (service status) are generated for each service ID. In this case, only service linkage not completed in a normal manner may be extracted, and, service linkage logs may be generated. The result can be obtained as to whether service linkage has been completed in a normal manner, by extracting only the one that service linkage has not been completed in a normal manner. Fig. 13 shows an example of logs of the service processors 24 performing specific processing constituting service linkage and service linkage logs each generated as processing results of service linkage itself. By referring to the service linkage logs, it can be confirmed whether service linkage has been completed in a normal manner. Fig. 13 shows an example in which all service linkages of service IDs (001-003) have been completed in a normal manner, and service linkage of service ID 004 failed in document distribution by the document distribution server 24C of a third service. That is, in this example, the comparison determination unit 46 of the linkage processing server 22 compares device logs with logs of the service processor to determine that a log of the document distribution server 24C does not exist. Accordingly, it is understood that the service linkage of service ID (004) failed in document distribution of the third service.

[0094]

Additionally, the contents of service linkage logs shown in Fig. 13 are not limited to this. Log contents of the service processors 24 may be incorporated as needed.

[0095]

Here, the linkage processing server 22 distributes the generated service linkage logs (S60). For example, when an instruction of obtaining the service linkage processing results is issued from the client terminal 14, service linkage logs generated in the linkage processing server

22 are distributed to the client terminal 14, stored in a specified folder of the client terminal 14, or printed to the multi-function device 24D. In other words, the user can confirm whether service linkage has been completed in a normal manner by referring to the distributed service linkage logs. If it has been completed in an abnormal manner, the service processor 24 in which the problem has occurred can be specified from the service linkage logs, and the service linkage can be performed again from the service processor 24 in which the problem has occurred.

[0096]

Next, checking of service linkage processing results performed as described above is described using an example.

[0097]

Fig. 14 shows an example of a relationship among the image processor 24A, the document management server 24B, and the document distribution server 24C when a request is made to the image processor 24A, the document management server 24B, and the document distribution server 24C to perform service linkage for image data received by reading images by the scanner function of the multi-function device 24D or image data obtained by a facsimile device. That is, this example shows service linkage corresponding to the service ID (004) of Fig. 13.

[0098]

The service processors 24 are operated as described above. That is, in the service processors 24, logs of processing results in the respective service processors 24 are generated by the log generating unit 24f and stored in association with a service ID. That is, logs as shown in Fig. 11 are generated and stored in the respective service processors 24.

[0099]

Here, when a request for obtaining the service linkage processing results is made through the UI 42 of the linkage processing server 22, logs stored in the service processors 24 are obtained by the log receiving unit 44 of the linkage processing server 22. It is determined whether processing results of service linkage are normal by comparing the processing results on a service ID basis by the log comparison determination unit 46. Service linkage logs as shown in Fig. 13 are generated in the comparison result generating unit 48 [In section [0064], 48 was described as a "comparison determination result generating unit 48"]. At this time, only abnormal processing results of service linkage may be extracted to generate service linkage logs. Thus, the result can be obtained as to whether service linkage has been completed in a normal manner.

[0100]

Additionally, the service linkage logs generated in the comparison result generating unit 48 are transmitted to a folder of, for example, the client terminal 14 making a request to transmit linkage processing results, or transmitted by electronic mail.

[0101]

Accordingly, the user can receive a service linkage log for each service linkage by use of the client terminal 14 to make a request to obtain service linkage processing results, and thereby can reliably confirm whether service linkage has been completed in a normal manner. For example, in Fig. 13, as described above, since no document distribution is made in the third service of service ID (004), it is understood that service linkage corresponding to the service ID (004) is not completed in a normal manner until the end, and the document distribution can be performed again.

[0102]

Furthermore, the instruction form generating server 18, the instruction form management server 20, and the linkage processing server 22 of the document processing system 10 according to the first embodiment are respectively described as individual devices connected to the network 12. However, these functions may be incorporated in the multi-function device 24D and the like. Additionally, in this embodiment, the network 12 may be a public line. For example, a facsimile device may be configured as the individual device, and logs can be transmitted to the linkage processing server 22 and the like via a telephone line.

[0103]

[Second Embodiment]

A second embodiment of the present invention is described. Members in the second embodiment that are identical to members in the first embodiment are identified by the same reference numerals, and are excluded from detailed descriptions.

[0104]

Fig. 15 is a block diagram for explaining the interrelationship among service processors making up a document processing system 11 according to the second embodiment. The document processing system 11 according to the second embodiment can execute link processing of plural services without using the linkage processing server 22 described in the first embodiment.

[0105]

Furthermore, although the document processing system 11 includes the service processors 24 (except the linkage processing server 22) described in the first embodiment, only service processors 24 concerned in linkage processing are shown in Fig. 15.

[0106]

Additionally, in the document processing system 11 in the second embodiment, documents to be subject to service linkage are received from the multi-function device 24D.

[0107]

In addition, the multi-function device 24D in the second embodiment has a function for managing processing results on a service linkage basis like the linkage processing server 22 in the first embodiment.

[0108]

That is, as shown in Fig. 16, the multi-function device 24D has the processing result management function 40. As described in the first embodiment, the processing result management function 40 includes the user interface (UI) 42 through which a command is issued to check whether individual processing of the service processors 24 concerning service linkage has been completed in a normal manner, and the result of the checking is displayed; the log receiving unit 44 that obtains logs stored in the service processors 24; the log comparison determination unit 46 that determines whether the processing from logs received by the log receiving unit 44 has been completed in a normal manner; the comparison determination result generating unit 48 that generates service linkage logs representing comparison determination results of a given format from comparison determination results of the log comparison determination unit 46; and the result distribution unit 50 that stores service linkage logs in a predetermined folder, transmits electronic mails, and performs other processing.

[0109]

Furthermore, each means of the processing result management function 40 in this embodiment may be configured in hardware or with software programs.

[0110]

The service processors 24 store logs generated by the log generating unit 24f in the RAM 24c, as described in the first embodiment. In this embodiment, during service linkage, as shown in Fig. 16, a log corresponding to the service linkage is associated with a service ID and transmitted to a service processor 24 of a preceding stage, and a service processor 24 acquiring the log in turn transmits it to a service processor 24 of a further preceding stage. Ultimately, the log receiving unit 44 of the multi-function device 24D will receive all logs of the service processors 24 concerned in the service linkage.

[0111]

(Activation and Execution of Related Processing)

The user can select a desired instruction form from among plural instruction forms stored in the instruction form management server 20 to activate linkage processing. Details are given below.

[0112]

The client terminal 14 selects an instruction form representing desired service linkage processing from a service linkage processing selection screen according to the user's operations and directs the activation of the instruction form. The instruction form management server 20 transmits the instruction form specified by the client terminal 14 to the image processor 24A.

[0113]

The image processor 24A receives a document to be processed from the multi-function device 24D on the basis of information about the storage location of the document to be processed, which is described in the transmitted instruction form. Additionally, the document to be processed is image information, etc. received by facsimile receipt, a scanner function, or the like of the multi-function device 24D.

[0114]

The image processor 24A, for the received document image, interprets a service processing request, performs image processing such as noise elimination and OCR processing, and binds the processed image with an extracted text document. The image processor 24A, after the termination of predetermined image processing, deletes the service processing request described in the instruction form. The image processor 24A transmits a document in which the image document received by the image processing and the text document are bound, and the instruction form containing processing results such as processing status information (completion), output parameters, and information about a storage destination of the processed document to the document management server 24B providing a next service processor 24.

[0115]

After predetermined image processing is completed, the image processor 24A may modify or delete a portion related to a service request to the device itself, which is described in the instruction form, before transmitting the instruction form to the document management server 24B. Furthermore, after predetermined image processing is completed, the image processor 24A, may transmit the instruction form to a next service processor 24.

[0116]

The image processor 24A generates a log as a result of individual processing in the service linkage in the log generating unit 24f, associates the log with a service ID, and transmits it to the multi-function device 24D.

[0117]

The document management server 24B temporarily stores the document transmitted from the image processor 24A in a storage destination described in the instruction form. The

document management server 24B transmits the document and the instruction form to the document distribution server 24C that performs next service processing. The document management server 24B generates a log as a result of individual processing in the service linkage in the log generating unit 24f, associates the log with the service ID, and transmits the log to the multi-function device 24D through the image processor 24A, which is a service processor 24 of a preceding stage.

[0118]

The document distribution server 24C, on the basis of the instruction form, transmits only the text document of the document in which the text document and the image document are bound, to a mail address specified as a distribution destination, and transmits only the image document to a specified FAX number. Upon recognizing that the next processing is not described in the instruction form, the document distribution server 24C notifies the client terminal 14 that all processing has been completed, generates a log as a result of individual processing in the service linkage in the log generating unit 24f, associates the log with the service ID, transmits the log to the image processor 24A via the document management server 24B and the image processor 24A, which are service processors 24 of preceding stages, and completes the linkage processing.

[0119]

A description is made of processing in the service processors 24 of the document processing system 11 according to the second embodiment, with reference to a flowchart of Fig. 17.

[0120]

The service processors 24 determine whether they have received the instruction form and awaits until receiving it (S70). The service processors 24 duplicate and receive the document to be processed, on the basis of the storage destination location information of the document to be processed, which is described in the instruction form (S72). In this embodiment, the instruction form is transmitted from the instruction form management server 20 to the image processor 24A, the document management server 24B, and the document distribution server 24C in this order. However, the instruction form may be first transmitted from the multi-function device 24D to a service processor 24 performing individual processing in the beginning of service linkage, then successively to the service processors 24.

[0121]

The service processors 24 interpret a service processing request described in the instruction form and performs service processing for the received document (S74), and again stores the document, on which the service processing has been performed, in the original storage destination (S76).

[0122]

The service processor 24 determines whether individual processing based on the service processing request has been completed in a normal manner (S78). If so, it generates a log indicating normal completion by the log generating unit 24f (S80). If not, it generates a log indicating abnormal completion by the log generating unit 24f (S82). These logs are stored in the RAM 24c of the service processors 24.

[0123]

For example, in the same manner as in the first embodiment, as shown in Fig. 11, the log generating unit 24f of the service processors 24 logs a job ID for identifying processing in the

specified device, a service ID for identifying service linkage, a data input source, service linkage contents, processing contents (job contents) of the specified device, start time, required time, status (normal completion, abnormal completion, etc.), error contents at the time of abnormal completion, and the like.

[0124]

The service processors 24 transmit a log generated by the log generating unit 24f to a service processor 24 of a preceding stage (S84).

[0125]

The service processors 24 determine, from the instruction form, whether service of the following stage is present (S86). If there is no service of the following stage, processing of the service processors 24 is completed. If service of the following stage is present, the service processors 24 await until they receive a log sent from a service processor 24 performing service of the following stage (S88), and transmits the received log to a service processor 24 in which service of a preceding stage has been performed.

[0126]

Thus, as the service processors 24 performs processing, the multi-function device 24D can receive logs of the service processors 24 during service linkage by the log receiving unit 44 as shown in Fig. 11.

[0127]

A description is made of the checking of processing results during service linkage in the multi-function device 24D, with reference to a flowchart of Fig. 18.

[0128]

The multi-function device 24D determines whether processing of service linkage is started (S100). For example, this is done by determining whether a document transmission request concerned in the service linkage has been made from the service processors 24. If the service linkage is not started, the processing is immediately returned as-is and the multi-function device 24D returns to a state in which it can perform other processing. If the service linkage is started, it awaits until it receives logs from the service processors 24 (S102).

[0129]

Upon receiving the logs from the service processors 24, the multi-function device 24D determines whether obtaining processing results of service linkage is instructed, and awaits until the instruction is made (S104). Additionally, the service linkage processing result obtaining instruction can be made, for example, through a user interface such as an operation panel provided in the multi-function device 24D.

[0130]

When the service linkage processing result obtaining instruction is made, the multi-function device 24D performs log comparison determination processing to determine whether processing of each service linkage has been completed in a normal manner by the log comparison determination unit 46, on the basis of the received logs of the service processors 24 (S106). That is, it can be detected whether all service linkages have been completed in a normal manner by referring to results of processing of the service processors 24 for each of service IDs. At this point, service linkage log may be generated by extracting only service linkages not completed in a normal manner, and it can be determined whether service linkages have been completed in a normal manner, by extracting only service linkage logs of service linkages that have not been completed in a normal manner.

[0131]

In the same manner as in the first embodiment, a service linkage log of each service linkage is generated from the received logs of the service processors 24 (S108), and the generated service linkage log is distributed (S110).

[0132]

In other words, the user can confirm whether the service linkage has been completed in a normal manner, by referring to the distributed service linkage log. If it has been completed in an abnormal manner, a failed service processor 24 can be specified, and the service linkage can be again performed from the failed service processor 24.

[Third Embodiment]

Next, a third embodiment of the present invention is described. Members in the third embodiment that are identical to members in the first and second embodiments are identified by the same reference numerals, and are excluded from detailed descriptions.

[0133]

Although the document processing system 11 according to the second embodiment provides the processing result management function 40 for the multi-function device 24D, the processing result management function 40 may be provided in the service processors 24 performing services included in service linkage.

[0134]

For example, as shown in Fig. 19, the processing result management function 40 can be provided in the image processor 24A. In the document processing system according to the third embodiment, the processing result management function 40 is provided in a service processor 24 performing service included in service linkage. The third embodiment is described using an

example that the processing result management function 40 is provided in the image processor 24A as shown in Fig. 19.

[0135]

Also in this embodiment, each means of the processing result management function 40 may be configured in hardware or with software programs.

[0136]

In this case, the service processors 24 except the image processor 24A are operated in the same manner as in the second embodiment. Therefore, the detailed descriptions are omitted.

[0137]

When a log acquisition request is made from the image processor 24A, the multi-function device 24D transmits logs about images and documents subject to service linkage to the image processor 24A.

[0138]

Processing performed in the image processor 24A is described with reference to a flowchart of Fig. 20.

[0139]

The image processor 24A determines whether it has received the instruction form, and awaits until it receives the instruction form (S120). The image processor 24A duplicates and receives the document to be processed, on the basis of the storage destination location information of the document to be processed, which is described in the instruction form (S122). The document to be processed may be successively transferred to the service processors 24 together with the instruction form.

[0140]

The image processor 24A interprets a service processing request described in the instruction form and performs service processing for the received document (S124), and again stores the document, in which the service processing has been performed, in the original storage destination (S126).

[0141]

The image processor 24A determines whether specific processing based on the service processing request has been completed in a normal manner (S128). If it has been completed in a normal manner, it generates log indicating normal completion by the log generating unit 24f (S130). If it has not been completed in a normal manner, it generates log indicating abnormal completion by the log generating unit 24f (S132). These logs are stored in the RAM 24c of the image processor 24A.

[0142]

The image processor 24A determines whether logs have been received from the service processors 24 concerned in service linkage defined by the instruction form, and awaits until it receives logs generated in the service processors 24 (S134). Logs of the service processors 24 concerned in service linkage defined by the instruction form are transmitted from a service processor 24 of the last stage successively to the service processors 24 of preceding stages in the same manner as in the second embodiment, whereby the image processor 24A receives the logs of the service processors 24.

[0143]

The image processor 24A determines whether an instruction of obtaining processing results of service linkage is made, and awaits until the instruction is made (S136). When obtaining the service linkage processing result is instructed, the image processor 24A, in the log

comparison determination unit 46, performs log comparison determination processing to determine whether processing of each service linkage has been completed in a normal manner, on the basis of the received logs of the service processors 24 (S138).

[0144]

That is, from the results of individual processing of the service processors 24 for each service ID, in the same manner as in the first and second embodiments, a service linkage log of each service linkage is generated (S142), and the generated service linkage log is distributed (S142). When the service linkage log is generated, service linkage logs may be generated by extracting only abnormal processing results of service linkage, whereby it can be determined whether service linkage has been completed in a normal manner.

[0145]

In other words, the user can check whether the service linkage has been completed in a normal manner, by referring to the distributed service linkage log. If it has been completed in an abnormal manner, a failed service processor 24 can be specified, and the service linkage can be performed again from the failed service processor 24.

[0146]

In the document processing system of the third embodiment, the processing result management function 40 is provided in the image processor 24A, which is a service processor 24 performing processing in the beginning of service linkage defined by an instruction form. However, it may be provided in another service processor 24.

[0147]

Although, in the above-described embodiments, plural service processors 24 are linked to provide service for performing predetermined processing, the service may be provided by one multi-function device collectively including the functions of each device.

[0148]

[Effects of the Invention]

According to the present invention as described above, processing result logs of plural individual processes making up a service are received from plural devices, and service result information indicating whether the service has been completed in a normal manner is generated on the basis of the received processing result logs, whereby a service for performing predetermined processing on document data is processed through the linkage among plural devices connected to a network according to predetermined processing contents, without failing to recognize the occurrence of faults in the service devices.

[Brief Description of Drawings]

Fig. 1 is a block diagram showing a configuration of a document processing system according to a first embodiment of the present invention;

Fig. 2 is a block diagram showing a schematic configuration of a service processor;

Fig. 3 is a block diagram explaining the interrelationship among service processors making up a document processing system according to the first embodiment of the present invention;

Fig. 4 is a diagram showing the configuration of I/F information;

Fig. 5 is a diagram showing an example of an instruction form generating screen that is a GUI screen for defining a job flow;

Fig. 6 is a diagram showing an example of an instruction form formed in XML format;

Fig. 7 is a block diagram showing the configuration of a processing result management function included in a linkage processing server of the first embodiment;

Fig. 8 is a flowchart showing an example of a processing procedure of a client terminal and an instruction form generating server when an instruction form is generated;

Fig. 9 is a diagram showing an example of a service linkage processing selection screen representing an instruction form list;

Fig. 10 is a flowchart showing an example of processing performed in a service processor of the first embodiment;

Fig. 11 is a diagram showing an example of logs generated in a log generating part of service processors;

Fig. 12 is a flowchart showing the flow of processing result checking during service linkage performed in a linkage processing server of the first embodiment;

Fig. 13 is a diagram showing an example of processing result logs of service linkage;

Fig. 14 is a block diagram showing an example of the interrelationship among devices during processing result checking of service linkage in a document processing system according to the first embodiment of the present invention;

Fig. 15 is a block diagram explaining the interrelationship among service processors making up a document processing system according to a second embodiment of the present invention;

Fig. 16 is a block diagram showing an example of the interrelationship among devices during processing result checking of service linkage in a document processing system according to a second embodiment of the present invention;

Fig. 17 is a flowchart showing a flow of processing performed in each service processor of the second embodiment;

Fig. 18 is a flowchart showing a flow of processing result checking during service linkage performed in a multi-function device of the second embodiment;

Fig. 19 is a block diagram showing an example of the interrelationship among devices during processing result checking of service linkage in a document processing system according to a third embodiment of the present invention; and

Fig. 20 is a flowchart showing a flow of processing performed in a service processor (image processor) of the second embodiment.

[Explanation of the Symbols]

10, 11 Document processing system

12. Network

14. Client terminal

16. Service search server

18. Instruction form generating server

20. Instruction form management server

22. Linkage processing server

24. Service processor

24A. Image processor

24B. Document management server

24C. Document distribution server

24D. Multi-function device

24E. First service processor

24a. CPU

24b. ROM

24c. RAM

24d. UI

24e. Bus

24f. Log generating unit

44. Log receiving unit

46. Log comparison determination unit

48. Comparison determination result generating unit

50. Result distribution unit

[Document] Abstract

[Abstract]

[Problem]

An object of the present invention is to provide a service processing system that process a service for performing predetermined linkage processing on document data among plural devices connected to a network according to predetermined processing contents and can reliably find out if a problem has occurred in each service device.

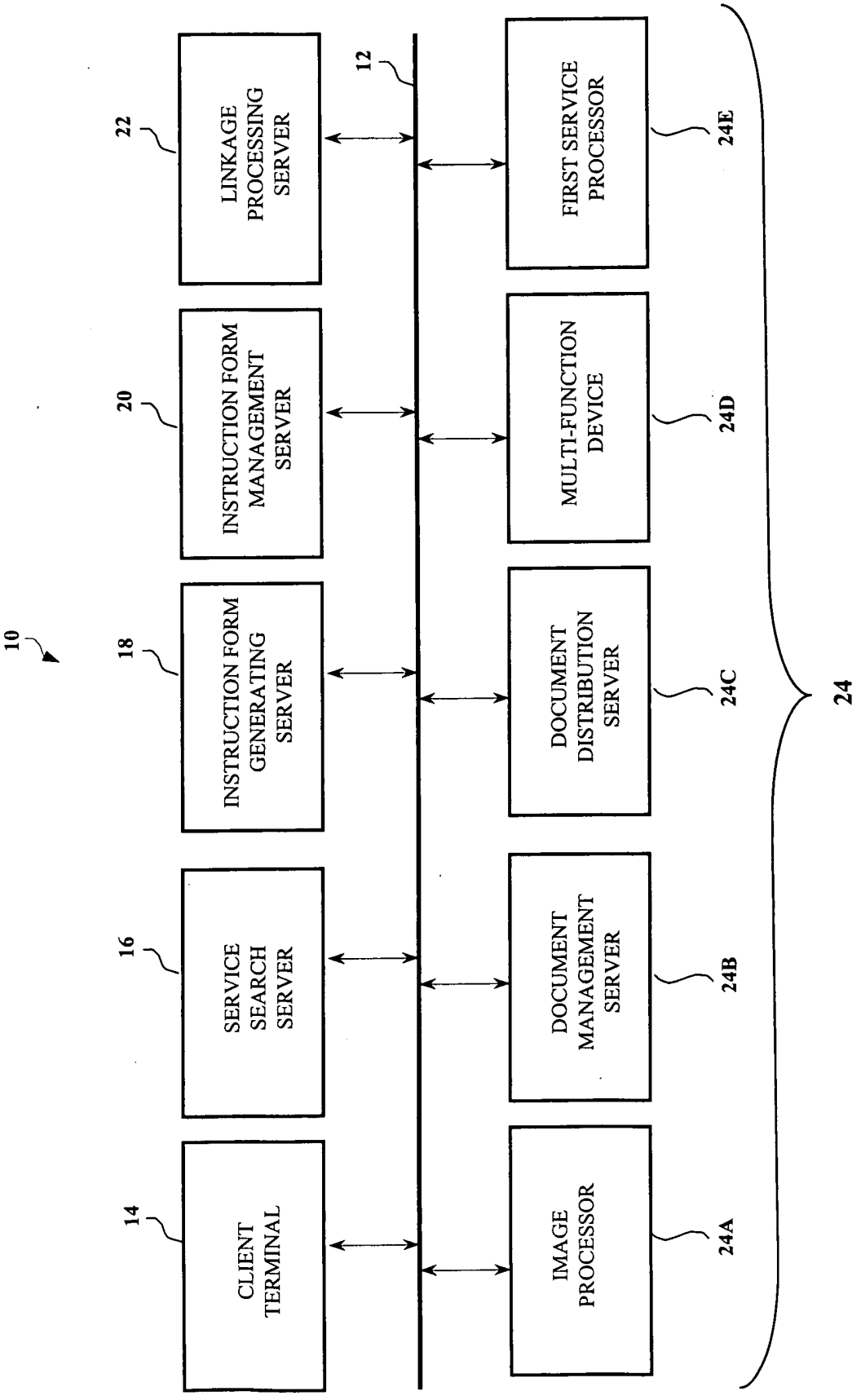
[Solving Means]

A log generating unit 24f of the service processors generates logs of processing results in the respective service processors and stores the logs associated with a service ID. Logs stored in service processors 24 are received by a log receiving unit 44 of a linkage processing server 22, whether processing results of service linkage are normal or not is determined by comparing the processing results of each service ID by a log comparison determination unit 46, and comparison result data as processing result logs is generated in a comparison determination result generating unit 48. With respect to the comparison result data, the linkage processing result is transmitted or electronically transmitted to a folder such as a client terminal.

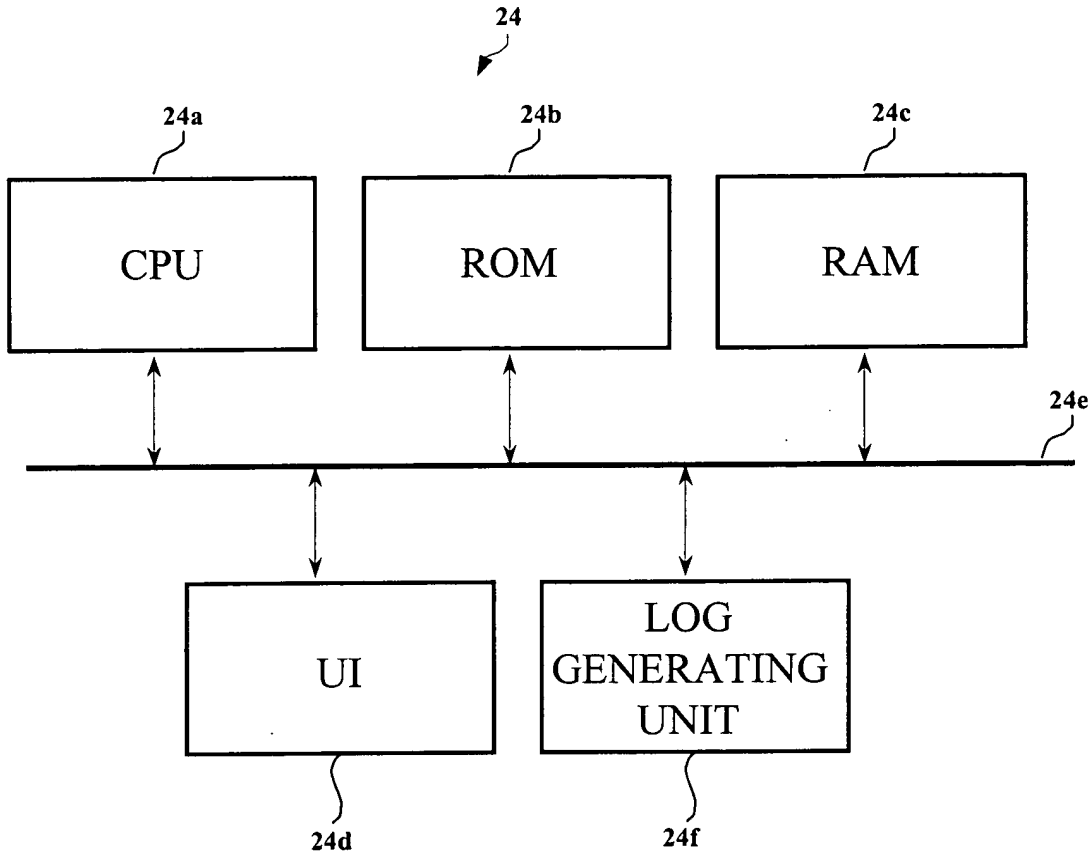
[Selected Figure] Fig. 14

[Document] Figures

[Fig. 1]



[Fig. 2]



[Fig. 3]

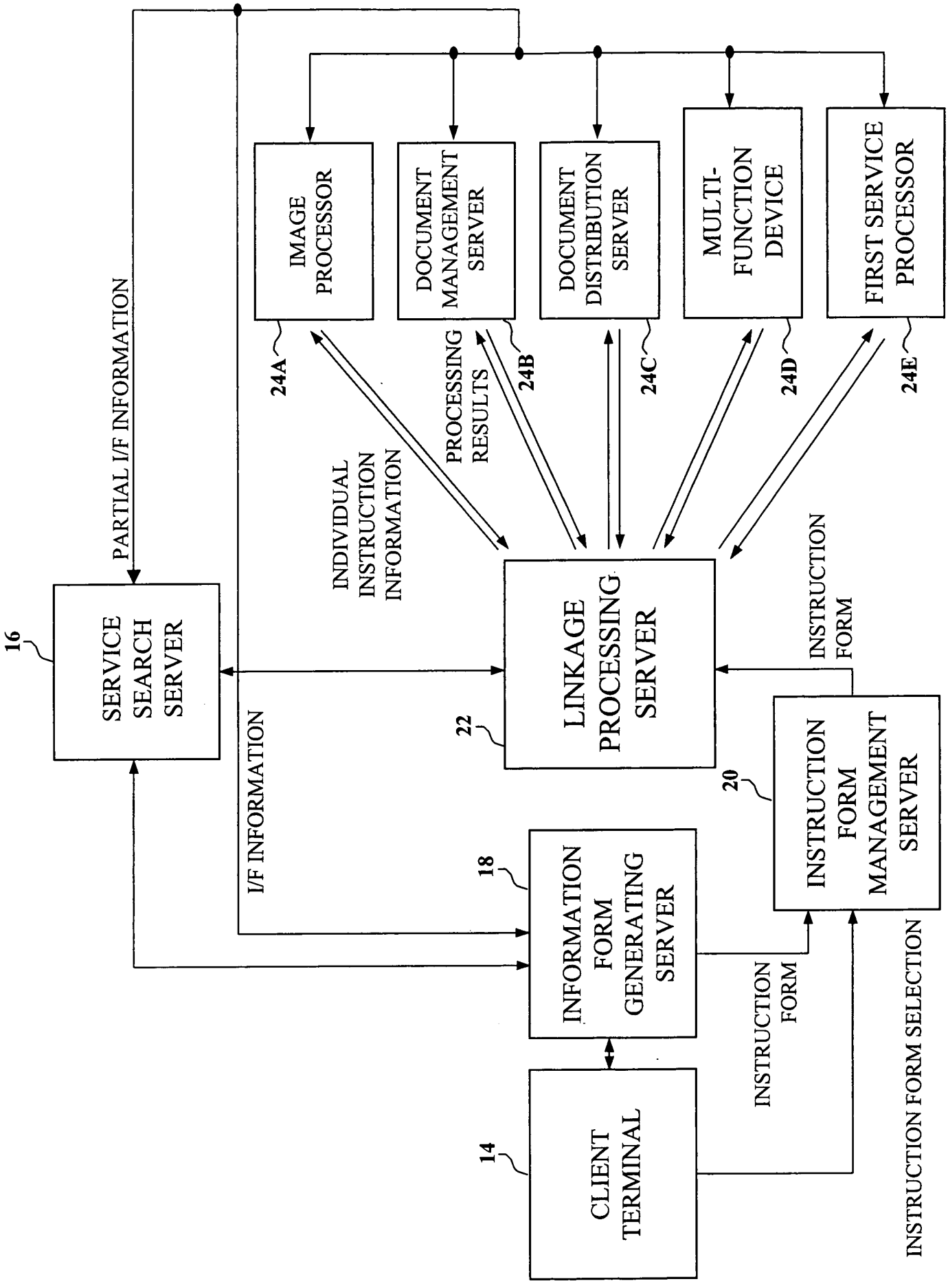
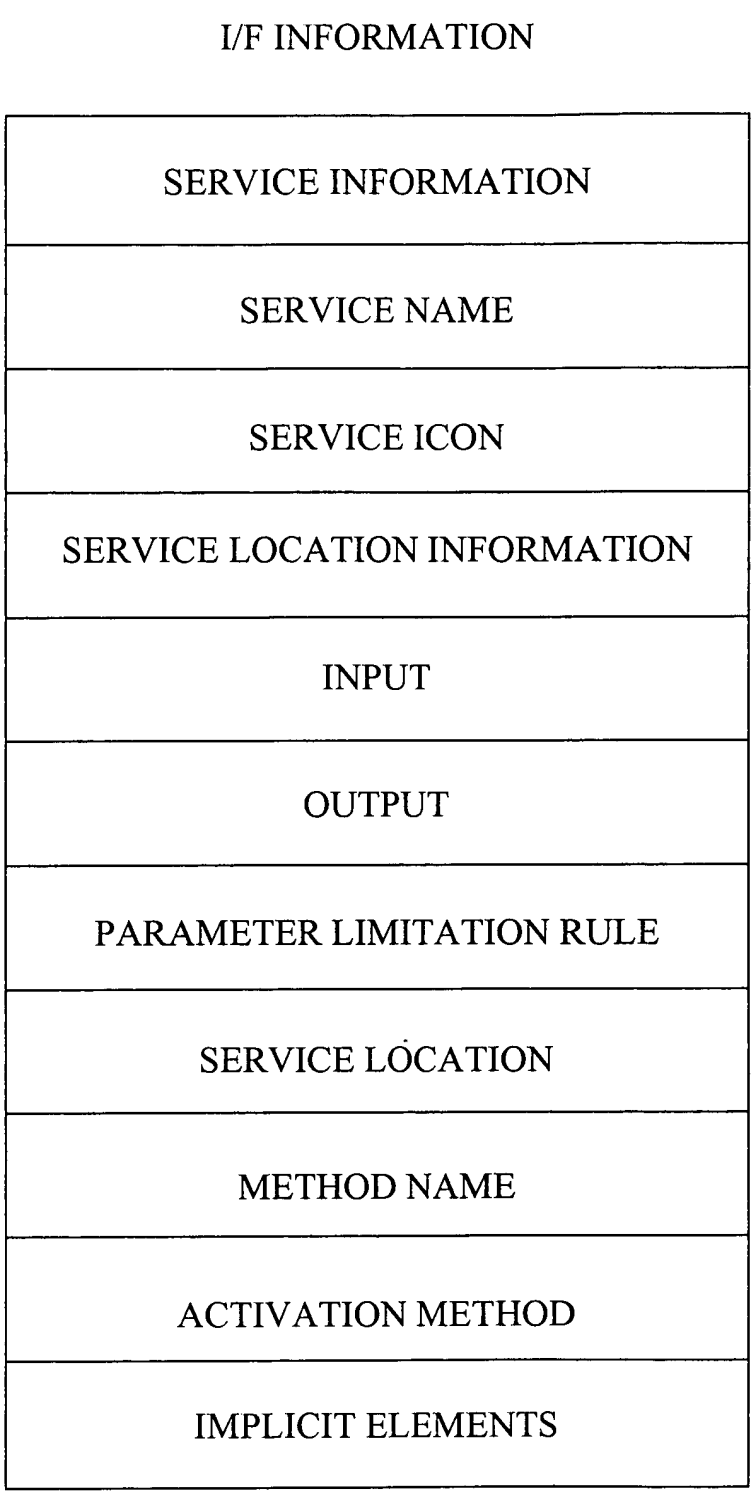
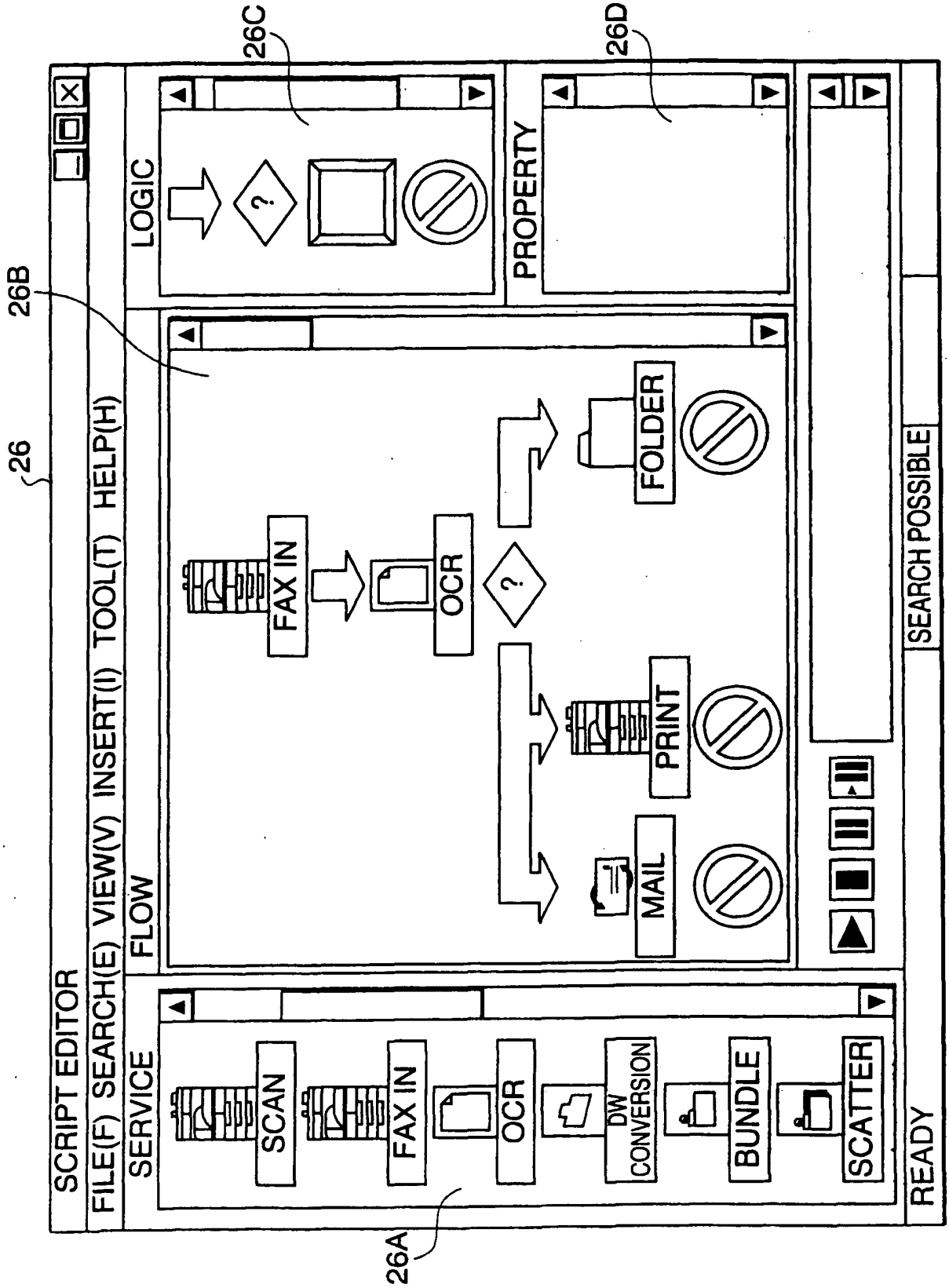


IMAGE PROCESSOR
DOCUMENT MANAGEMENT SERVER
DOCUMENT DISTRIBUTION SERVER
MULTI-FUNCTION DEVICE
FIRST SERVICE PROCESSOR
24A
24B
24C
24D
24E
PROCESSING RESULTS
INDIVIDUAL INSTRUCTION INFORMATION
PARTIAL I/F INFORMATION
16
SERVICE SEARCH SERVER
LINKAGE PROCESSING SERVER
22
INSTRUCTION FORM
20
INSTRUCTION FORM MANAGEMENT SERVER
I/F INFORMATION
18
INFORMATION FORM GENERATING SERVER
INSTRUCTION FORM
INSTRUCTION FORM SELECTION
14
CLIENT TERMINAL

[Fig. 4]


I/F INFORMATION
SERVICE INFORMATION
SERVICE NAME
SERVICE ICON
SERVICE LOCATION INFORMATION
INPUT
OUTPUT
PARAMETER LIMITATION RULE
SERVICE LOCATION
METHOD NAME
ACTIVATION METHOD
IMPLICIT ELEMENTS

[Fig. 5]

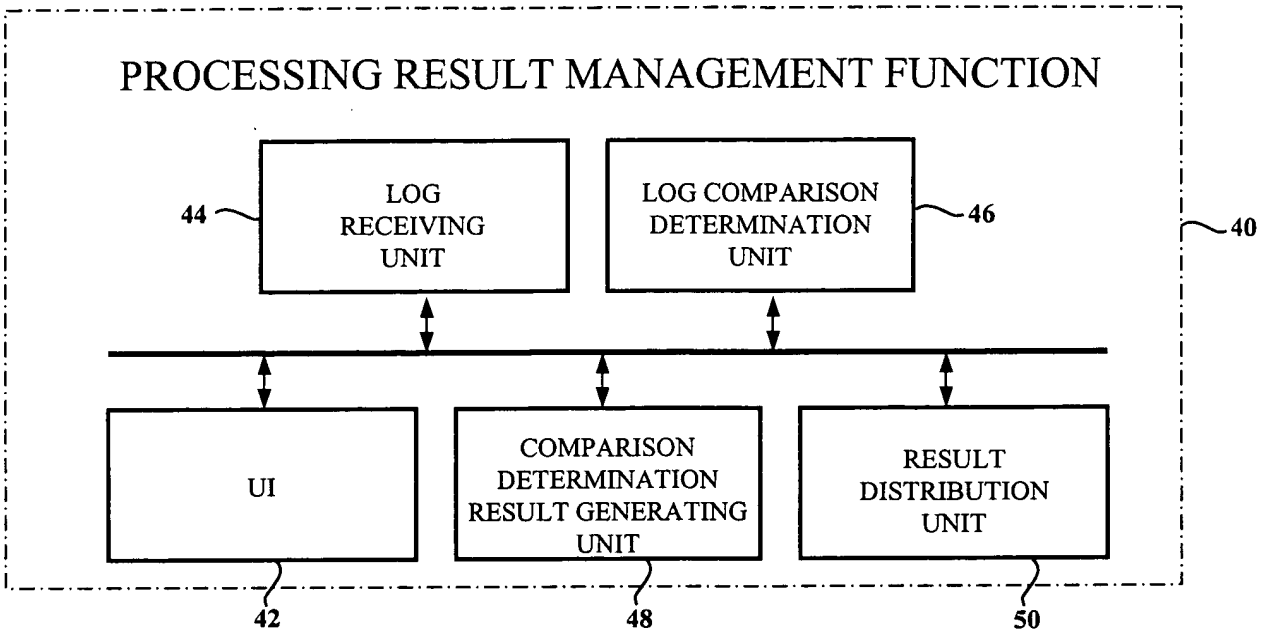

SCRIPT EDITOR
FILE(F) SEARCH(E) VIEW(V) INSERT(I) TOOL(T) HELP(H)
SERVICE
FLOW
LOGIC
PROPERTY
SCAN
FAX IN
OCR
DW CONVERSION
BUNDLE
SCATTER
FAX IN
OCR
FOLDER
PRINT
MAIL
SEARCH POSSIBLE
READY
26
26A
26B
26C
26D

[Fig. 6]

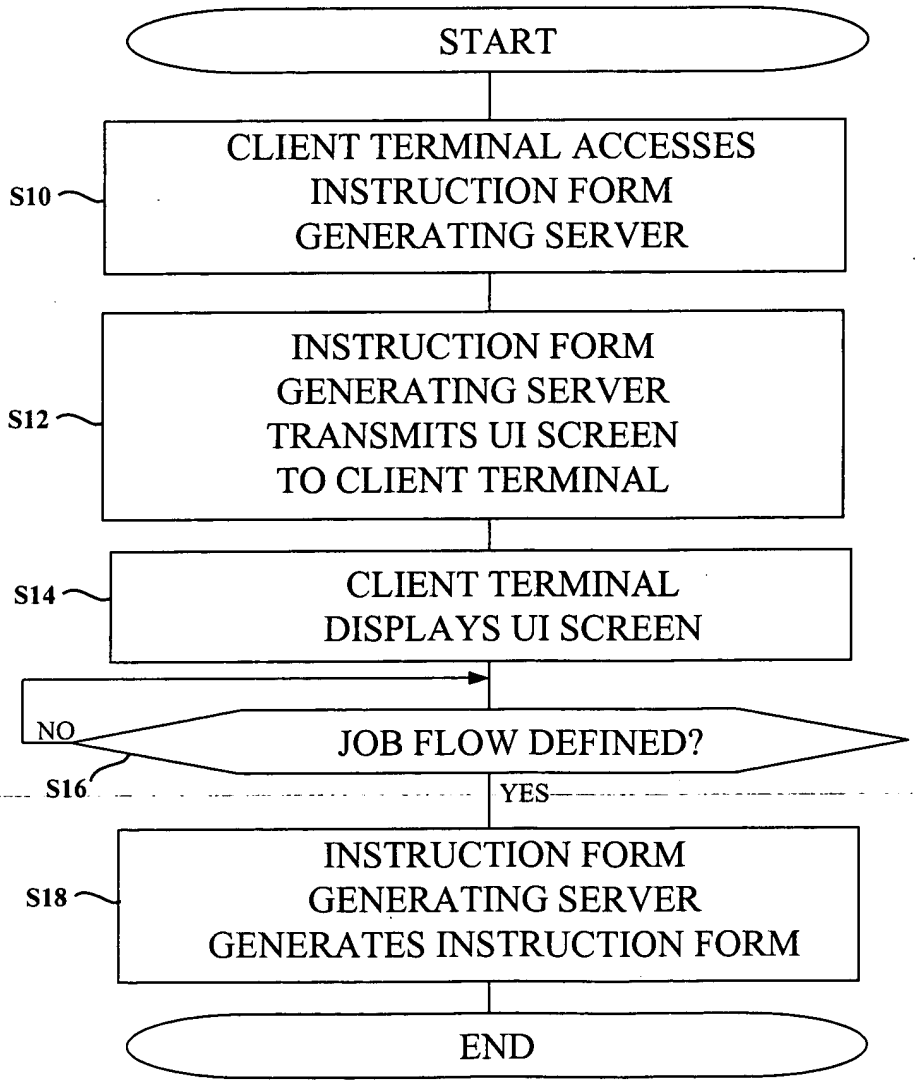
INSTRUCTION FORM

SERVICE INFORMATION
SERVICE NAME
SERVICE ICON
SERVICE LOCATION INFORMATION
INPUT
OUTPUT
PARAMETER LIMITATION RULE
SERVICE LOCATION
METHOD NAME
ACTIVATION METHOD
IMPLICIT ELEMENTS
FLOW (ACTIVATION, MAP, METHOD) (CONTROL STRUCTURE, LOGIC OPERATION)

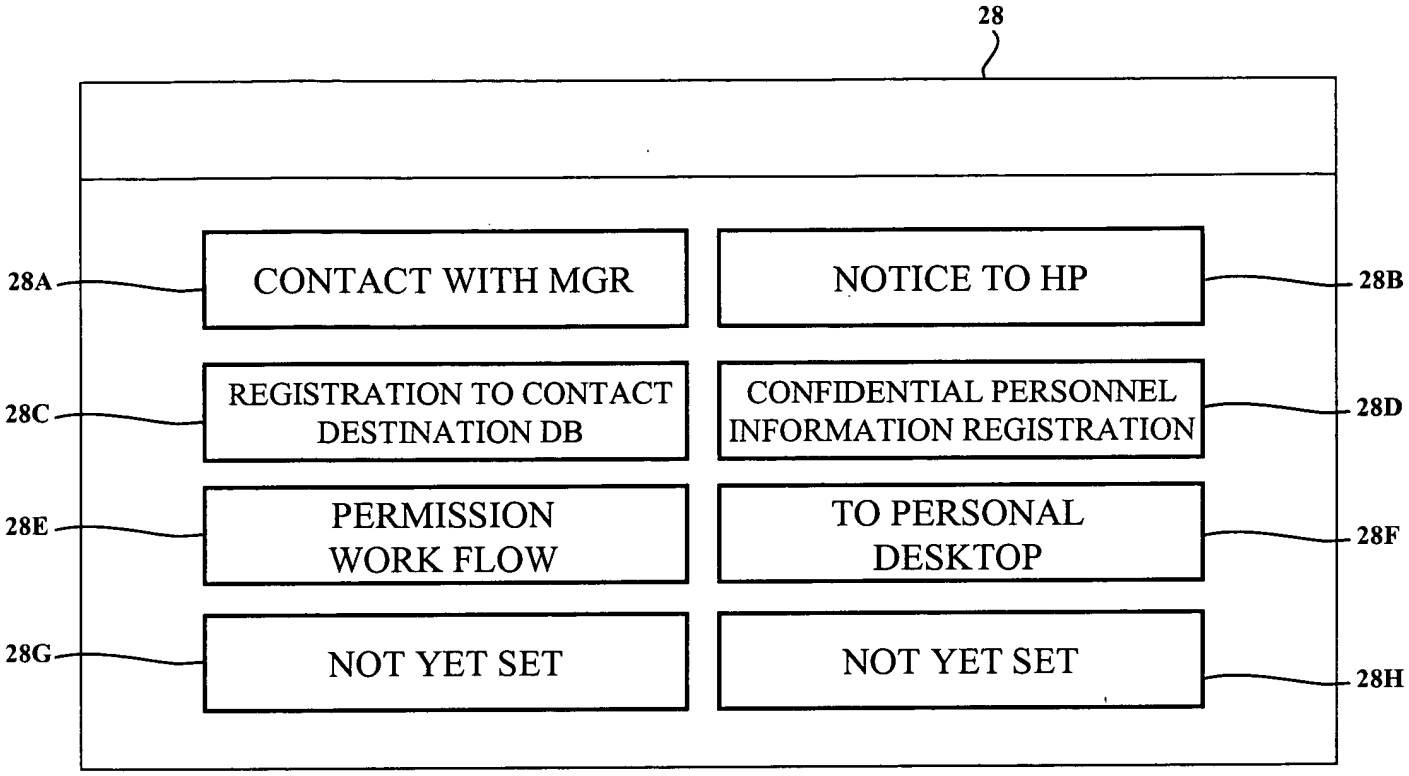
[Fig. 7]


PROCESSING RESULT MANAGEMENT FUNCTION
LOG RECEIVING UNIT
44
LOG COMPARISON DETERMINATION UNIT
46
40
UI
COMPARISON DETERMINATION RESULT GENERATING UNIT
RESULT DISTRIBUTION UNIT
42
48
50

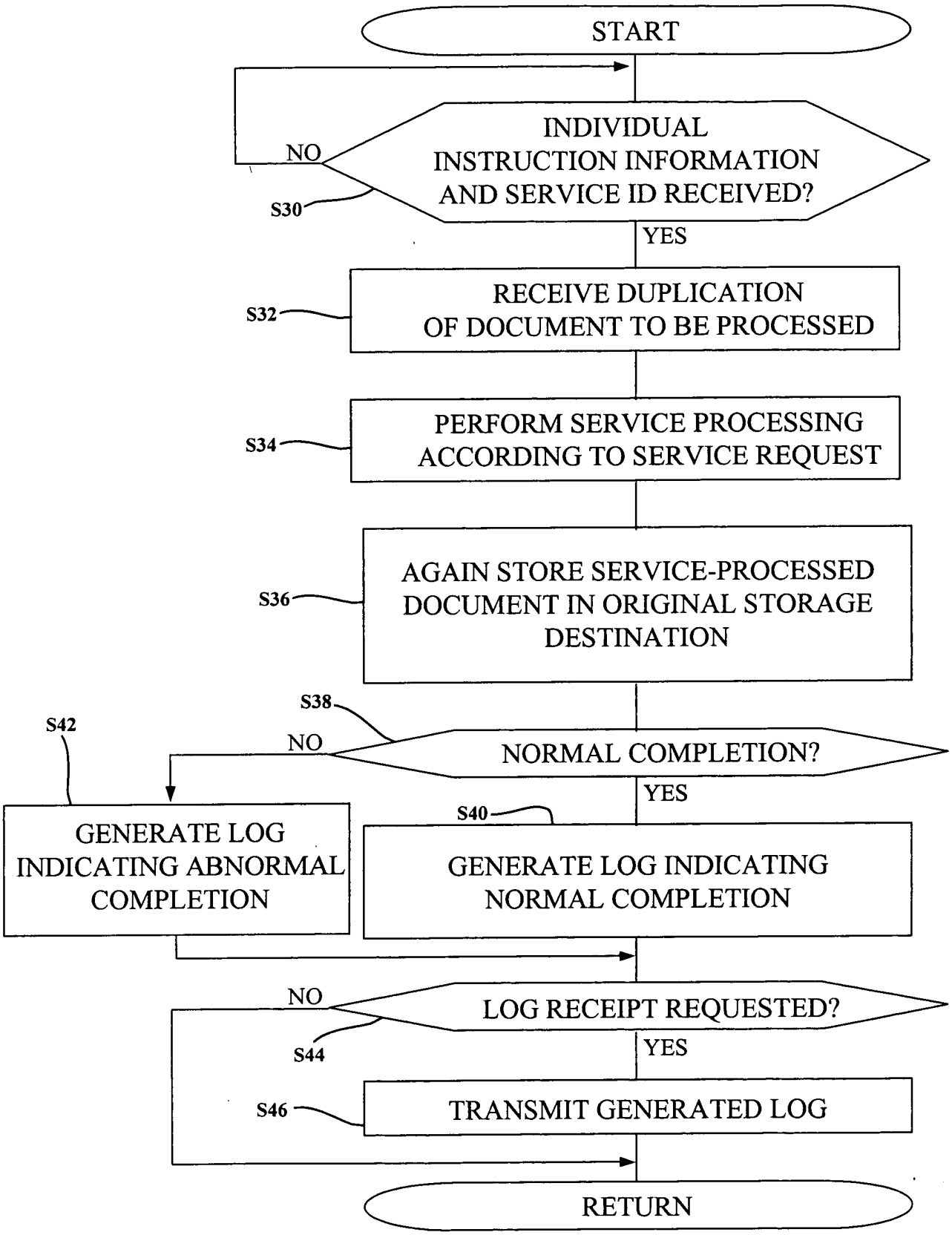
[Fig. 8]


START
S10
CLIENT TERMINAL ACCESSES INSTRUCTION FORM GENERATING SERVER
S12
INSTRUCTION FORM GENERATING SERVER TRANSMITS UI SCREEN TO CLIENT TERMINAL
S14
CLIENT TERMINAL DISPLAYS UI SCREEN
NO
JOB FLOW DEFINED?
S16
YES
S18
INSTRUCTION FORM GENERATING SERVER GENERATES INSTRUCTION FORM
END

[Fig. 9]


28
28A
CONTACT WITH MGR
NOTICE TO HP
28B
28C
REGISTRATION TO CONTACT DESTINATION DB
CONFIDENTIAL PERSONNEL INFORMATION REGISTRATION
28D
28E
PERMISSION WORK FLOW
TO PERSONAL DESKTOP
28F
28G
NOT YET SET
NOT YET SET
28H

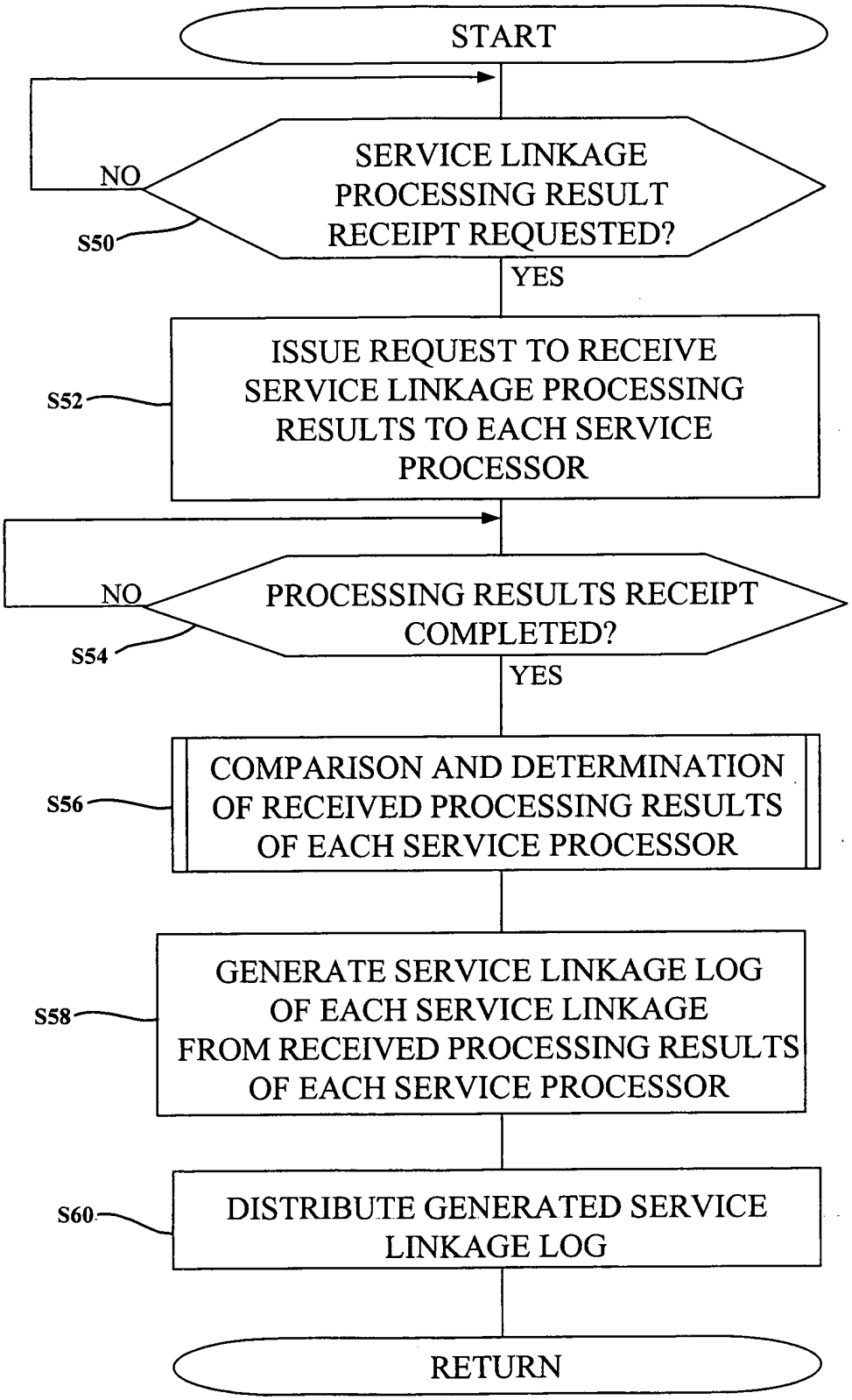
[Fig. 10]


START
INDIVIDUAL INSTRUCTION INFORMATION AND SERVICE ID RECEIVED?
NO
S30
YES
RECEIVE DUPLICATION OF DOCUMENT TO BE PROCESSED
S32
PERFORM SERVICE PROCESSING ACCORDING TO SERVICE REQUEST
S34
AGAIN STORE SERVICE-PROCESSED DOCUMENT IN ORIGINAL STORAGE DESTINATION
S36
S38
NORMAL COMPLETION?
NO
YES
S42
S40
GENERATE LOG INDICATING ABNORMAL COMPLETION
GENERATE LOG INDICATING NORMAL COMPLETION
LOG RECEIPT REQUESTED?
NO
S44
YES
TRANSMIT GENERATED LOG
S46
RETURN

[Fig. 11]

NO.	JOB ID	SERVICE ID	INPUT SOURCE	SERVICE LINKAGE CONTENTS	JOB CONTENTS	START TIME	REQUIRED TIME	STATUS	ERROR CONTENT
1	0026	002	MULTI-FUNCTION DEVICE	O△□XXX	XXXX	11-6:11:57 AM	43 SECONDS	NORMAL	—
2	0027	003	IMAGE PROCESSOR	OO△□OX	XXXX	11-6:2:25 PM	20 SECONDS	NORMAL	—
3	0028	004	DOCUMENT MANAGE-MENT SERVER	XXXOXX	XXXX	11-6:4:50 PM	45 SECONDS	NORMAL	—
4	0029	007	MULTI-FUNCTION DEVICE	XXXOXX	XXXX	11-7:11:57AM	44 SECONDS	ERROR	COMMUNI-CATION ERROR

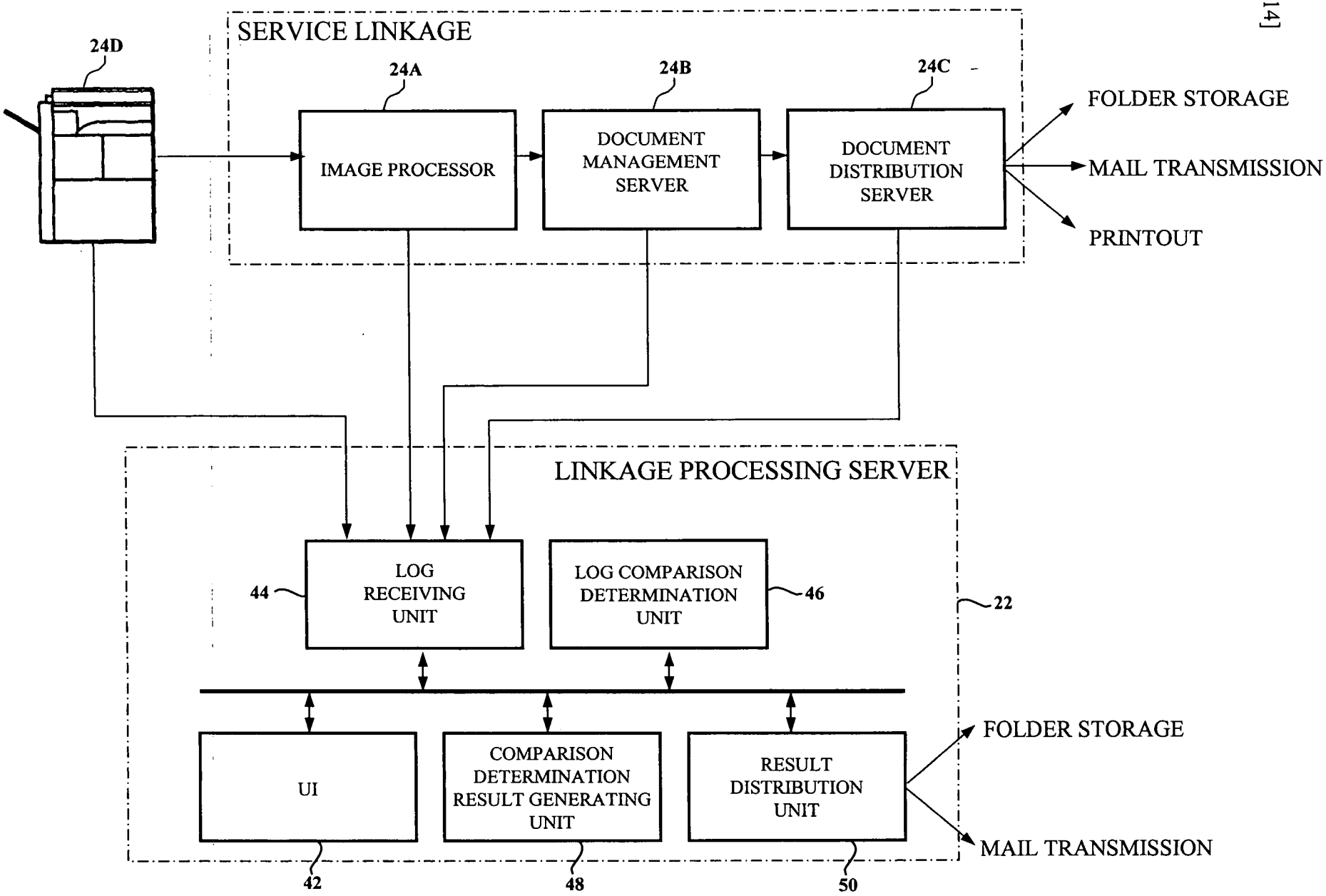
[Fig. 12]


START
SERVICE LINKAGE PROCESSING RESULT RECEIPT REQUESTED?
NO
S50
YES
ISSUE REQUEST TO RECEIVE SERVICE LINKAGE PROCESSING RESULTS TO EACH SERVICE PROCESSOR
S52
PROCESSING RESULTS RECEIPT COMPLETED?
NO
S54
YES
COMPARISON AND DETERMINATION OF RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S56
GENERATE SERVICE LINKAGE LOG OF EACH SERVICE LINKAGE FROM RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S58
DISTRIBUTE GENERATED SERVICE LINKAGE LOG
S60
RETURN

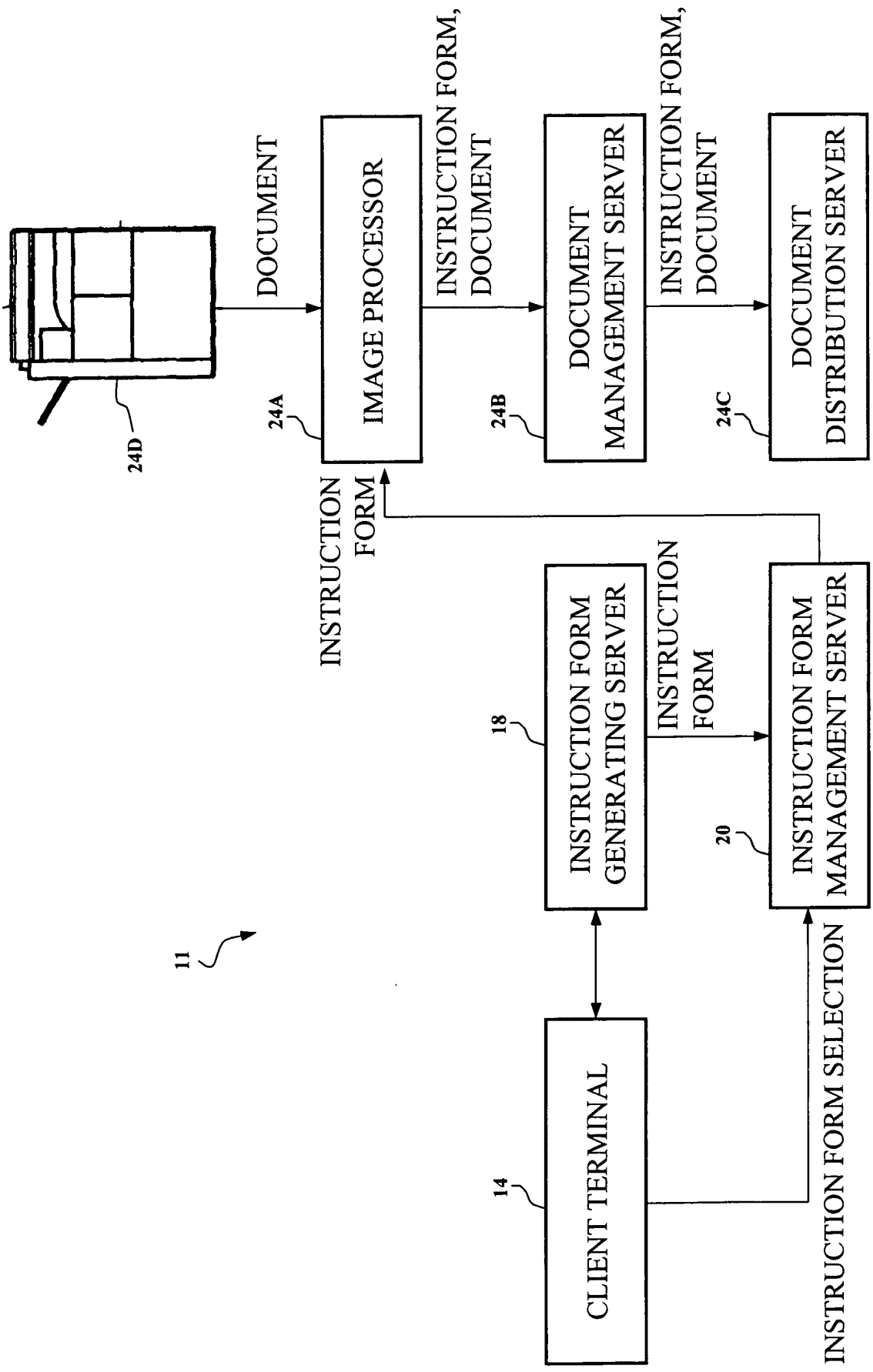
[Fig. 13]

SERVICE ID	SERVICE STATUS	DEVICE LOG	START TIME	STATUS	FIRST SERVICE LOG	START TIME	STATUS	SECOND SERVICE LOG	START TIME	STATUS	THIRD SERVICE LOG	START TIME	STATUS
001	NORMAL	MULTI-FUNCTION DEVICE	11-6:11:57	NORMAL	IMAGE PROCESSOR	11-6:12:02	NORMAL	DOCUMENT MANAGE-MENT SERVER	11-6:12:04	NORMAL	DOCUMENT DISTRIBUTION SERVER	11-6:12:08	NORMAL
002	NORMAL	CLIENT TERMINAL	11-6:13:24	NORMAL	MULTI-FUNCTION DEVICE	11-6:13:25PM	NORMAL	IMAGE PROCESSOR	11-6:13:28	NORMAL	CLIENT TERMINAL	11-6:13:30	NORMAL
003	NORMAL	DOCUMENT MANAGE-MENT SERVER	11-6:14:50	NORMAL	DOCUMENT MANAGE-MENT SERVER	11-6:14:51	NORMAL	DOCUMENT MANAGE-MENT SERVER	11-6:14:52	NORMAL	DOCUMENT MANAGEMENT SERVER	11-6:14:55	NORMAL
004	AB-NORMAL	MULTI-FUNCTION DEVICE	11-7:11:57	NORMAL	IMAGE PROCESSOR	11-7:11:58	NORMAL	DOCUMENT MANAGE-MENT SERVER	11-7:12:00	NORMAL	DOCUMENT DISTRIBUTION SERVER	—	—

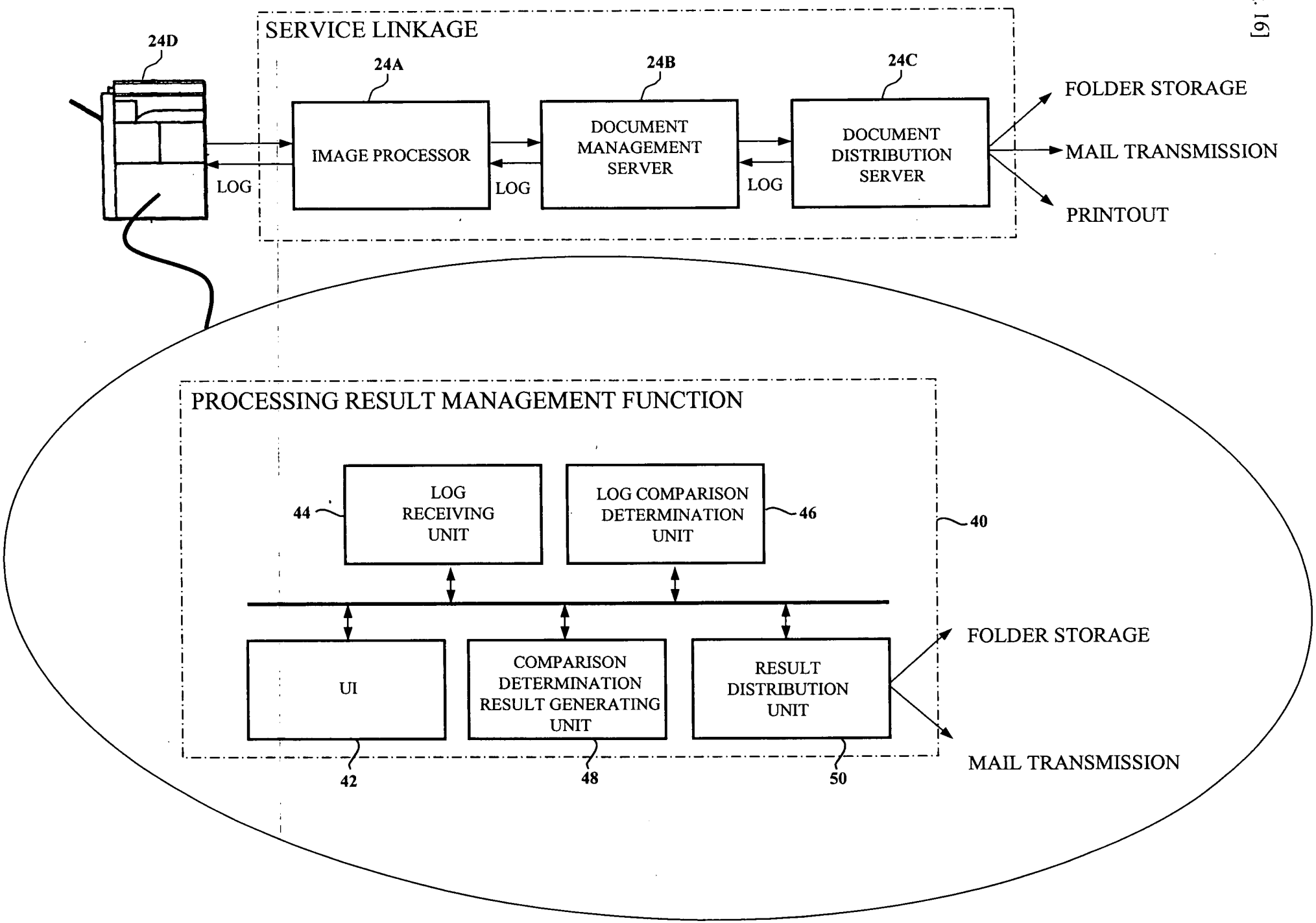
[Fig. 14]


SERVICE LINKAGE
24D
24A
24B
24C
IMAGE PROCESSOR
DOCUMENT MANAGEMENT SERVER
DOCUMENT DISTRIBUTION SERVER
FOLDER STORAGE
MAIL TRANSMISSION
PRINTOUT
LINKAGE PROCESSING SERVER
44
LOG RECEIVING UNIT
LOG COMPARISON DETERMINATION UNIT
46
22
UI
COMPARISON DETERMINATION RESULT GENERATING UNIT
RESULT DISTRIBUTION UNIT
FOLDER STORAGE
MAIL TRANSMISSION
42
48
50

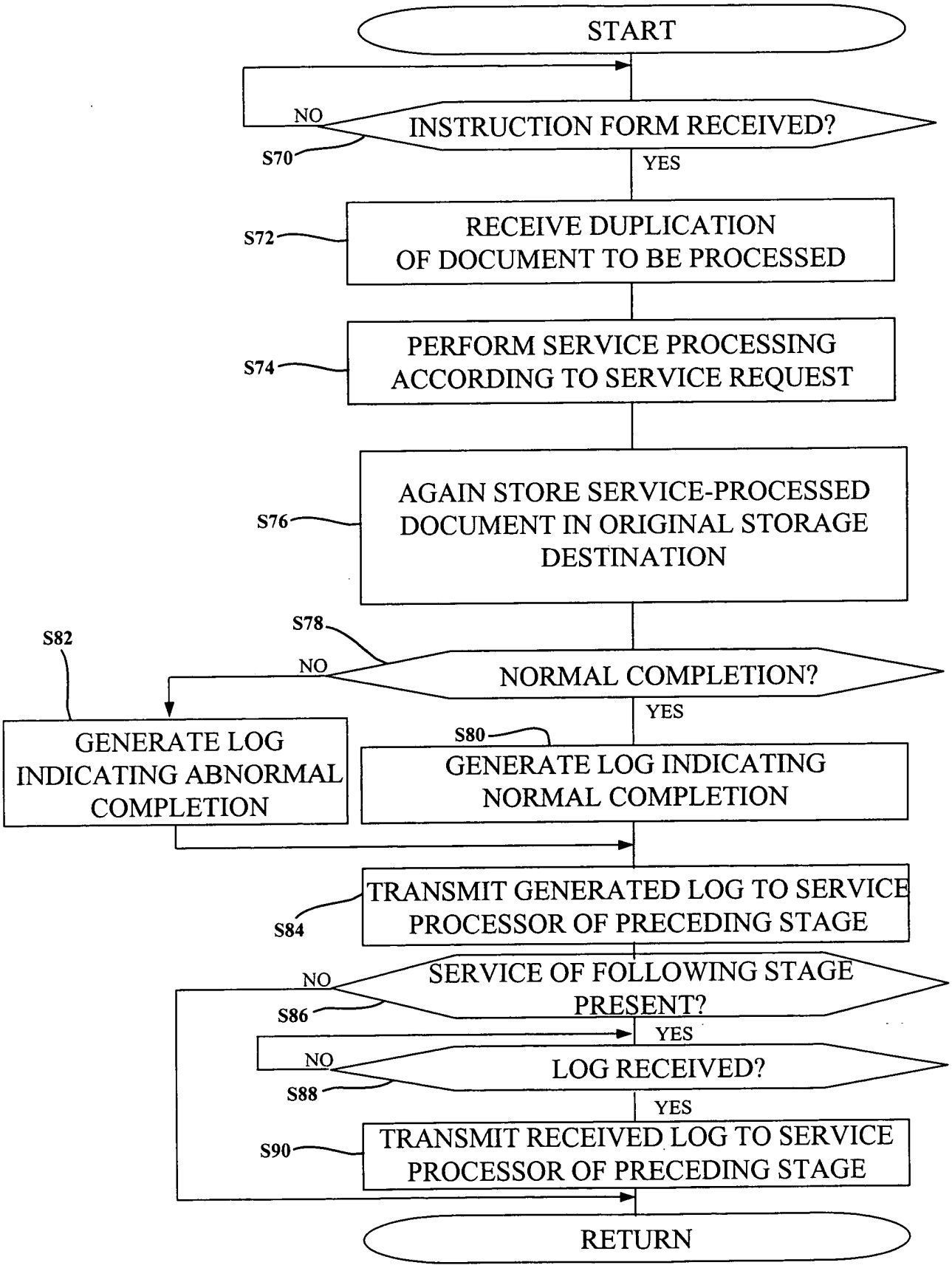
[Fig. 15]


DOCUMENT
IMAGE PROCESSOR
INSTRUCTION FORM, DOCUMENT
DOCUMENT MANAGEMENT SERVER
INSTRUCTION FORM, DOCUMENT
DOCUMENT DISTRIBUTION SERVER
24A
24B
24C
24D
INSTRUCTION FORM
INSTRUCTION FORM GENERATING SERVER
INSTRUCTION FORM
INSTRUCTION FORM MANAGEMENT SERVER
18
20
11
CLIENT TERMINAL
14
INSTRUCTION FORM SELECTION

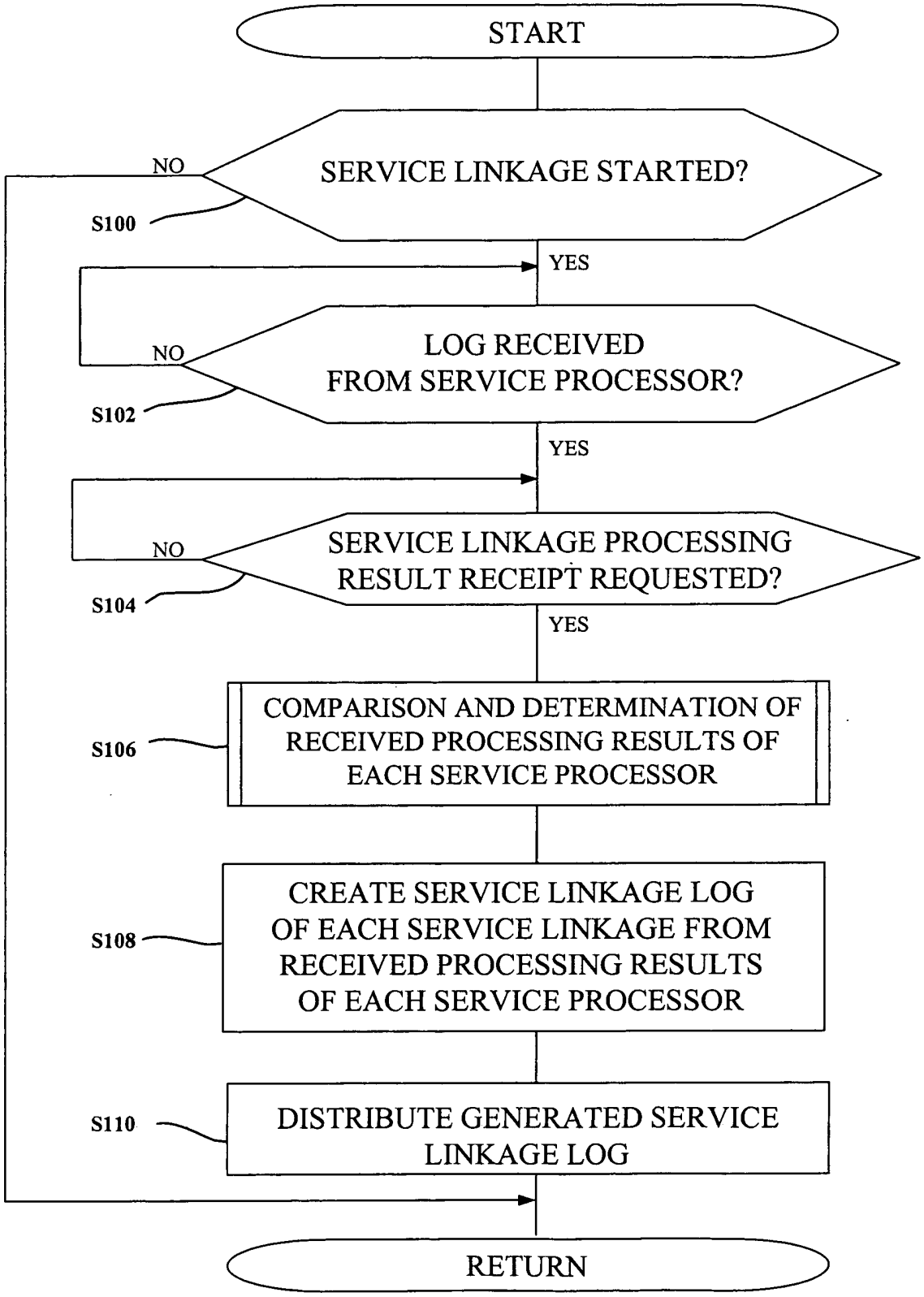
[Fig. 16]


SERVICE LINKAGE
24D
24A
24B
24C
IMAGE PROCESSOR
DOCUMENT MANAGEMENT SERVER
DOCUMENT DISTRIBUTION SERVER
LOG
LOG
LOG
FOLDER STORAGE
MAIL TRANSMISSION
PRINTOUT
PROCESSING RESULT MANAGEMENT FUNCTION
44
LOG RECEIVING UNIT
LOG COMPARISON DETERMINATION UNIT
46
40
UI
COMPARISON DETERMINATION RESULT GENERATING UNIT
RESULT DISTRIBUTION UNIT
FOLDER STORAGE
MAIL TRANSMISSION
42
48
50

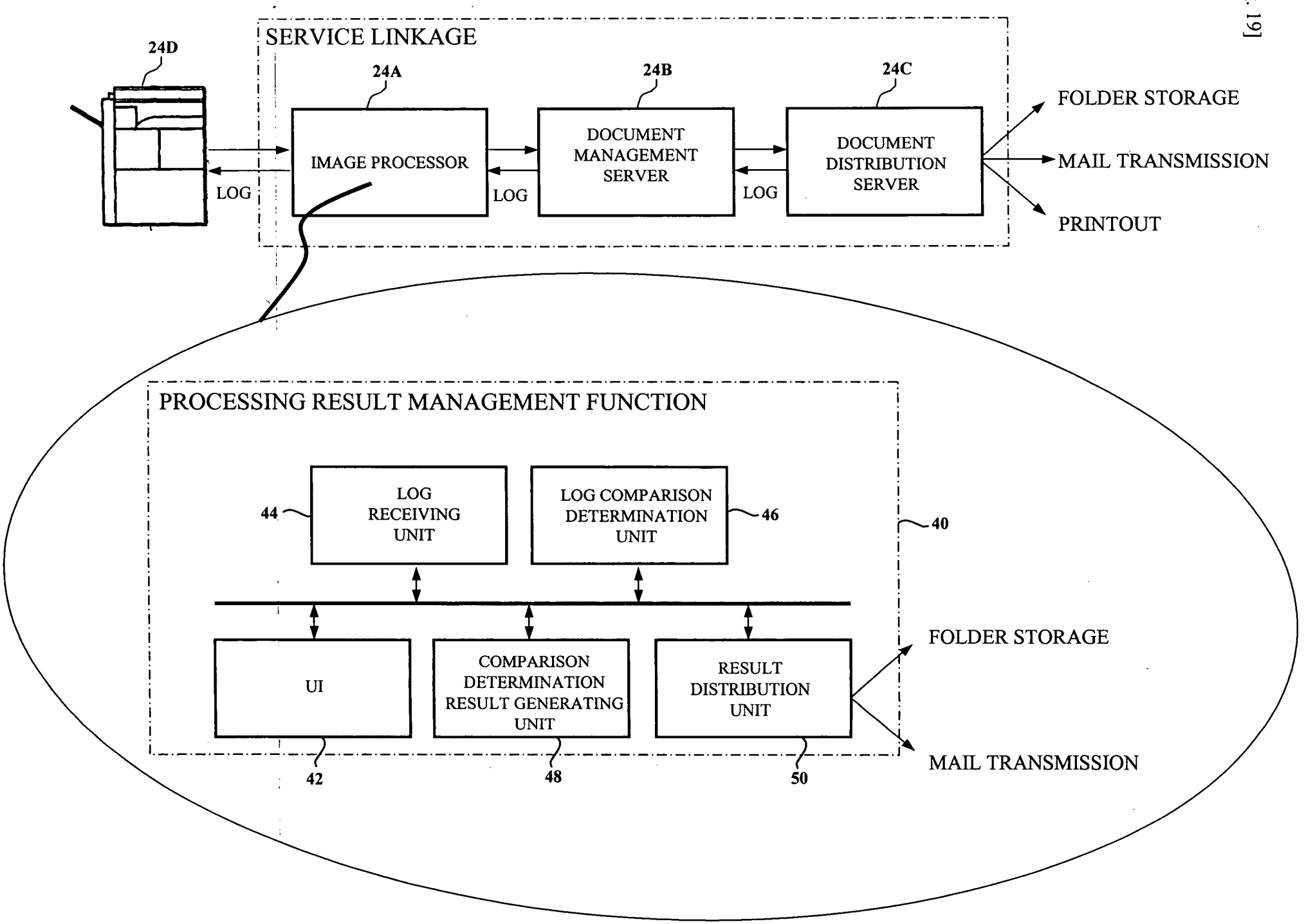
[Fig. 17]


START
INSTRUCTION FORM RECEIVED?
NO
S70
YES
RECEIVE DUPLICATION OF DOCUMENT TO BE PROCESSED
S72
PERFORM SERVICE PROCESSING ACCORDING TO SERVICE REQUEST
S74
AGAIN STORE SERVICE-PROCESSED DOCUMENT IN ORIGINAL STORAGE DESTINATION
S76
S78
NORMAL COMPLETION?
NO
YES
S82
GENERATE LOG INDICATING ABNORMAL COMPLETION
S80
GENERATE LOG INDICATING NORMAL COMPLETION
TRANSMIT GENERATED LOG TO SERVICE PROCESSOR OF PRECEDING STAGE
S84
SERVICE OF FOLLOWING STAGE PRESENT?
NO
S86
YES
LOG RECEIVED?
NO
S88
YES
TRANSMIT RECEIVED LOG TO SERVICE PROCESSOR OF PRECEDING STAGE
S90
RETURN

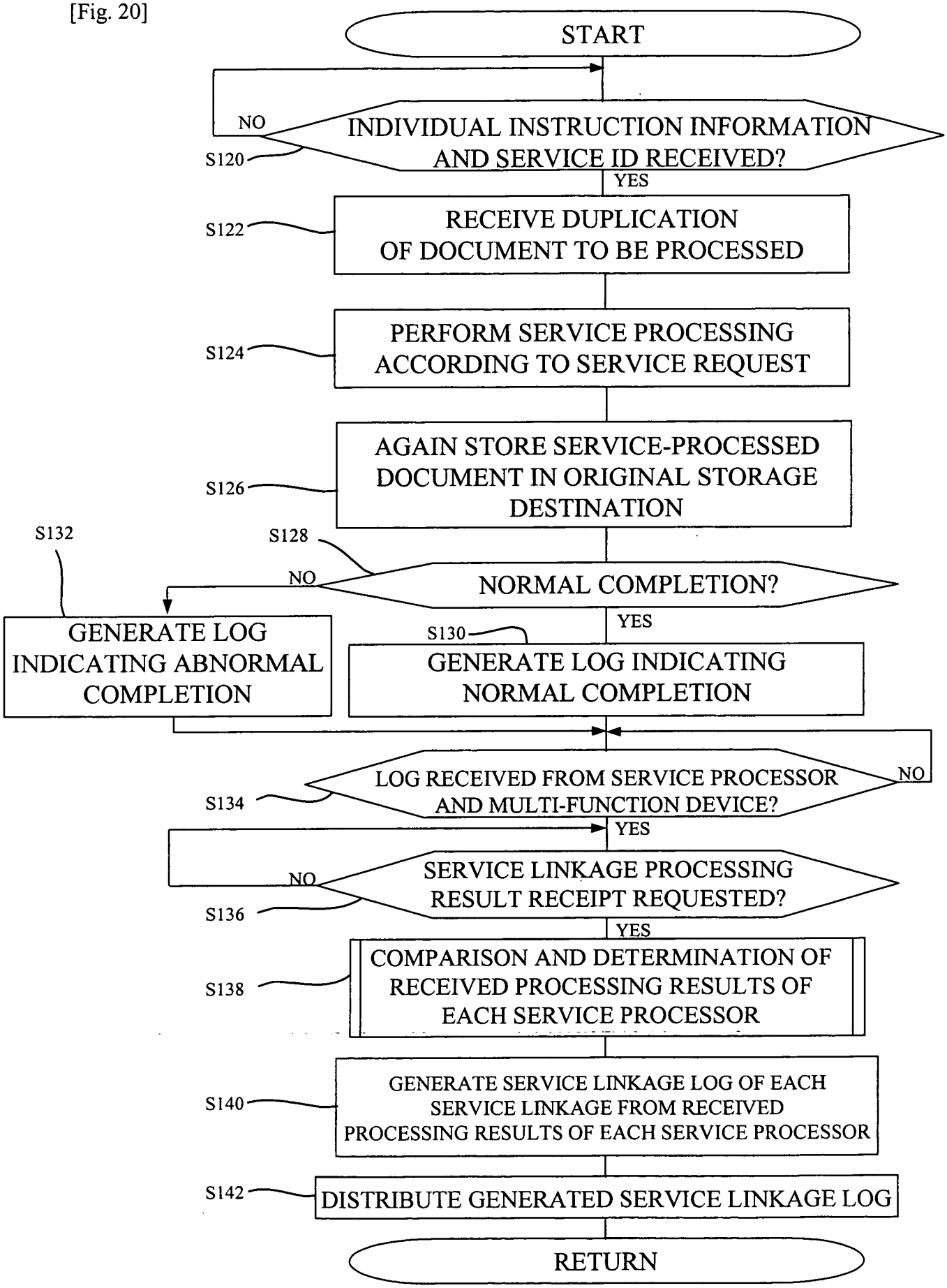
[Fig. 18]


START
SERVICE LINKAGE STARTED?
NO
S100
YES
LOG RECEIVED FROM SERVICE PROCESSOR?
NO
S102
YES
SERVICE LINKAGE PROCESSING RESULT RECEIPT REQUESTED?
NO
S104
YES
COMPARISON AND DETERMINATION OF RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S106
CREATE SERVICE LINKAGE LOG OF EACH SERVICE LINKAGE FROM RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S108
DISTRIBUTE GENERATED SERVICE LINKAGE LOG
S110
RETURN

[Fig. 19]


SERVICE LINKAGE
24D
24A
24B
24C
IMAGE PROCESSOR
DOCUMENT MANAGEMENT SERVER
DOCUMENT DISTRIBUTION SERVER
LOG
LOG
LOG
FOLDER STORAGE
MAIL TRANSMISSION
PRINTOUT
PROCESSING RESULT MANAGEMENT FUNCTION
44
LOG RECEIVING UNIT
LOG COMPARISON DETERMINATION UNIT
46
40
UI
COMPARISON DETERMINATION RESULT GENERATING UNIT
RESULT DISTRIBUTION UNIT
FOLDER STORAGE
MAIL TRANSMISSION
42
48
50

[Fig. 20]


START
INDIVIDUAL INSTRUCTION INFORMATION AND SERVICE ID RECEIVED?
NO
S120
YES
S122
RECEIVE DUPLICATION OF DOCUMENT TO BE PROCESSED
S124
PERFORM SERVICE PROCESSING ACCORDING TO SERVICE REQUEST
S126
AGAIN STORE SERVICE-PROCESSED DOCUMENT IN ORIGINAL STORAGE DESTINATION
S128
NORMAL COMPLETION?
NO
S132
GENERATE LOG INDICATING ABNORMAL COMPLETION
YES
S130
GENERATE LOG INDICATING NORMAL COMPLETION
LOG RECEIVED FROM SERVICE PROCESSOR AND MULTI-FUNCTION DEVICE?
NO
S134
YES
SERVICE LINKAGE PROCESSING RESULT RECEIPT REQUESTED?
NO
S136
YES
S138
COMPARISON AND DETERMINATION OF RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S140
GENERATE SERVICE LINKAGE LOG OF EACH SERVICE LINKAGE FROM RECEIVED PROCESSING RESULTS OF EACH SERVICE PROCESSOR
S142
DISTRIBUTE GENERATED SERVICE LINKAGE LOG
RETURN